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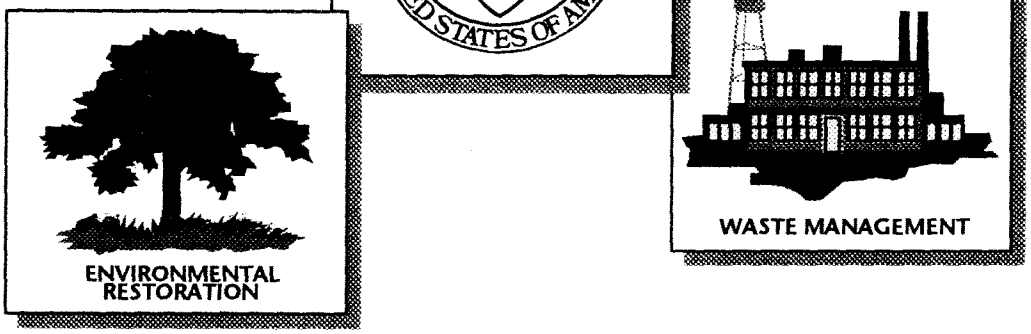
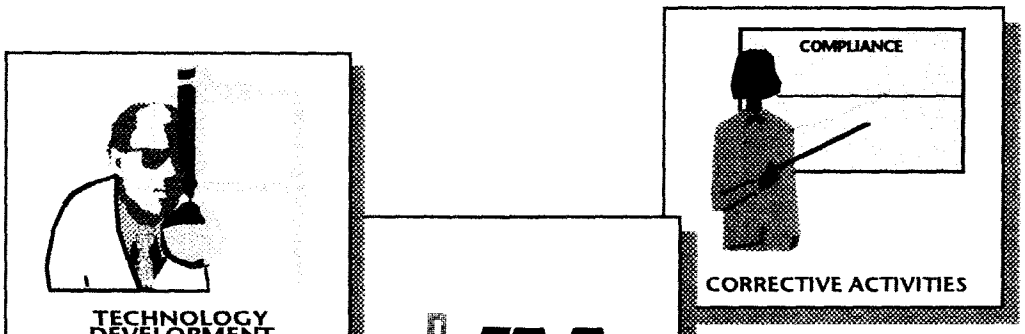


Fiscal Year 1992 Site-Specific Plan



EG&G
ROCKY FLATS

ROCKY FLATS PLANT

FISCAL YEAR 1992
SITE-SPECIFIC PLAN

September 10, 1991

FY92 SITE-SPECIFIC PLAN

The purpose of this Site-Specific Plan (SSP) is to describe Environmental Restoration and Waste Management activities at Rocky Flats, with emphasis on those in progress during fiscal year (FY) 1992. This plan includes activities outlined in the U.S. Department of Energy's (DOE's) Environmental Management Five-Year Plan (FYP) and environmental activities funded by the Defense Programs organization of the DOE.

The SSP includes the following topics: (1) an introduction with an overview of organizational structures; (2) discussion of the site's Environmental Restoration and Waste Management activities by category, including Corrective Activities, Environmental Restoration, Waste Management, and Technology Development; (3) an explanation of the site's Quality Assurance program; and (4) regulatory requirements affecting Environmental Restoration and Waste Management activities at the site, planning assumptions, and agreements to which the DOE, Rocky Flats Office is a party.

Continuing efforts have been made to improve readability. Public comments on the FY91 SSP indicated that its new format better served the public in terms of readability. The same format has been used for the FY92 SSP, including the glossary (Appendix E), which explains technical terms and acronyms and simplified diagrams illustrating various activities. The SSP is intended to complement the FYP by highlighting planned activities within a given fiscal year, but it also includes discussions pertaining to Environmental Restoration and Waste Management activities funded outside the scope of the FYP (Defense Program activities). Because of the dynamic nature of the FYP, budget data within the SSP are not final.

For the first time, the SSP is being made available to the public prior to the start of the fiscal year. Comments received on the FY91 SSP have been incorporated into the draft FY92 edition. A public information meeting will be conducted to solicit comments on the FY92 SSP from the public. Issues and recommendations received during these meetings will be incorporated into a comment response document, which will be provided to the public in mid-November 1991. Comments regarding the FY91 SSP are addressed directly in Appendix F. Your suggestions and recommendations are most welcome. Comments regarding this SSP and the related public meeting may be directed to:

U.S. Department of Energy Rocky Flats Office
Beth Brainard, Public Affairs Officer
P.O. Box 928
Golden, Colorado 80402

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1.0 INTRODUCTION

1.1 INTRODUCTION TO THE FY92 SITE-SPECIFIC PLAN AND RELATED PLANNING DOCUMENTS

In March 1989, Secretary of Energy James D. Watkins made a commitment to clean up DOE nuclear-related sites and bring them into compliance with all applicable environmental laws and regulations. In an effort to fulfill this commitment, the Office of Environmental Management (DOE/EM) was established. This organization was formed to enhance the visibility of DOE's environmental problems and to increase accountability for identifying and implementing solutions. Environmental restoration and waste management activities at the Rocky Flats Plant are managed by the U.S. Department of Energy's Rocky Flats Office (DOE/RFO), under the guidance of DOE/EM.

As a planning tool for DOE/RFO and to provide information to the public, the SSP has been written to delineate environmental restoration and waste management activities at Rocky Flats. The emphasis of the SSP is recent accomplishments and near-term planned activities, primarily those that will be accomplished in FY92. This plan reflects current planning, including the impacts of recent agreements and FY92 funding allocations. The SSP serves to complement the Rocky Flats Environmental Restoration and Waste Management FYP and the DOE National FYP, which is the foundation of DOE's long-term strategy for environmental restoration and waste management. The final draft of the FY92 SSP will be issued for public review on August 1, 1991. Public comments on the FY92 SSP will be addressed in a separate Comment Response Document, which will be issued on November 15, 1991.

In August 1989, DOE issued the first edition of the FYP. The plan, which has a five-year planning horizon, is revised annually. The purpose of the FYP is to (1) establish an agenda for cleanup and compliance against which progress will be measured, (2) show DOE's current strategy and planned activities to meet cleanup and compliance commitments through FY97, and (3) increase the involvement of other agencies and the public in DOE's planning. The FYP encompasses total program activities and costs for Environmental Restoration and Waste Management (ER&WM) programs (Corrective Activities, Environmental Restoration, Waste Management, and Technology Development) for Rocky Flats. The FYP addresses hazardous wastes, radioactive wastes, mixed wastes (radioactive and hazardous), and sanitary wastes. It also addresses facilities and sites contaminated with or used in management of those wastes.

To provide input for the DOE National FYP, EG&G Rocky Flats, Inc. (EG&G), the Management & Operating (M&O) Contractor at Rocky Flats, prepares Activity Data Sheets (ADSs). These ADSs describe the ER&WM activities at Rocky Flats necessary to comply with applicable environmental regulations and to pursue the goals of DOE/EM. ADSs also define budgets and schedules for ER&WM activities. The ADSs are compiled to create the Rocky Flats FYP, which is submitted to DOE/Headquarters, where it is merged with plans

from the other DOE sites into the National FYP. Detailed information regarding in-progress or planned ER&WM activities is included in the Rocky Flats FYP.

1.2 SCOPE

The SSP describes the work that will be performed at Rocky Flats during FY92. The major sections of this plan provide supporting details for activities in four areas: Corrective Activities, Environmental Restoration, Waste Management, and Technology Development. The plan covers activities funded by DOE Defense Programs (DOE/DP) and DOE/EM. The major elements of the SSP are briefly described in the following subsections.

1.2.1 Corrective Activities

Corrective Activities are activities required to bring the site into compliance with federal and state regulations and other DOE/U.S. Environmental Protection Agency (EPA)/Colorado Department of Health (CDH) agreements pertaining to air, surface water, groundwater, and solids. Because they address only these specific out-of-compliance conditions, Corrective Activities have been assigned the highest priority of all ER&WM activities. Corrective Activities, as defined by DOE, do not include activities needed to meet compliance objectives for handling wastes. The efforts needed to comply with RCRA regulations pertaining to waste treatment, storage, and disposal are included under Waste Management activities.

1.2.2 Environmental Restoration

Environmental restoration includes cleanup of areas or buildings that have been contaminated in the past and now are either (1) closed down and out of commission or (2) not being actively used in routine operations. Rocky Flats has identified and prioritized 178 contaminated sites, which are called Individual Hazardous Substance Sites (IHSSs) (formerly called Solid Waste Management Units [SWMUs]), on and off plant site. These contaminated sites have been grouped according to location and waste type into Operable Units (OUs). Contamination in these groups is being assessed, and cleanup activities are being implemented. Sites with potentially higher risk are being addressed before sites with potentially lower risk. Sites undergoing assessment and/or remediation in FY92 include Operable Unit 1 (OU 1) - 881 Hillside; OU 2 - 903 Pad, Mound, and East Trenches; and OU 4 - Solar Evaporation Ponds. Maps showing the location of the OUs and a list of the IHSSs are provided in Appendix B.

1.2.3 Base Environmental Programs

Base environmental programs at Rocky Flats provide ongoing environmental monitoring, reporting, and modeling support to the plant. Air-related activities include ongoing monitoring of stack effluents, radioactive and nonradioactive air monitoring, air dispersion modeling, Clean Air Act compliance, and meteorological monitoring. Water management activities encompass routine water sampling programs, surface water and groundwater monitoring, and other water management issues. Soil-related activities include routine sampling of soils on plant site and soil sampling to support special projects. These ongoing activities are separate and distinct from ER&WM activities and are funded by DOE/DP.

1.2.4 Waste Management

Rocky Flats operations generate solid and liquid wastes that must be treated and/or stored prior to final disposal. Activities planned by Waste Management address the minimization, treatment, storage, and disposal of plant waste products. Waste Management support activities include program planning, permitting, and monitoring.

Waste Management currently faces three major issues. The first issue relates to storage and disposal. The site is restricted by federal regulations and operating permits regarding the amounts of different types of waste that may be stored and must address capacity constraints. In addition, the site must maintain compliance with storage regulations in all of its storage facilities. Activities to address storage/disposal issues include improvement and expansion of storage facilities and certification of wastes to meet disposal criteria at offsite disposal facilities.

Second, the Waste Programs/Waste Operations divisions of EG&G must operate all waste packaging, treatment, and storage facilities in compliance with applicable regulations. Activities are planned to meet requirements of the CDH/DOE Agreement in Principle (AIP) and the Federal Facility Compliance Agreement (FFCA) for Land Disposal Restricted (LDR) waste. These activities will ensure regulatory compliance throughout plant waste operations.

Third, mixed (hazardous and radioactive) residues must now be managed as hazardous waste. These mixed residues are destined for recycle rather than disposal, but handling and storage of residues is still governed by the Resource Conservation and Recovery Act (RCRA). The site is pursuing compliance with RCRA under the Residue Compliance Agreement (RCA).

1.2.5 Technology Development

The role of Technology Development at the site is identification and demonstration of new or existing technologies that will allow Rocky Flats to satisfy its environmental management goals. Technology Development projects at Rocky Flats focus on minimizing waste, creating waste forms suitable for land disposal, developing better methods for assaying waste, and enhancing monitoring capabilities.

1.3 PURPOSE OF SITE-SPECIFIC PLAN

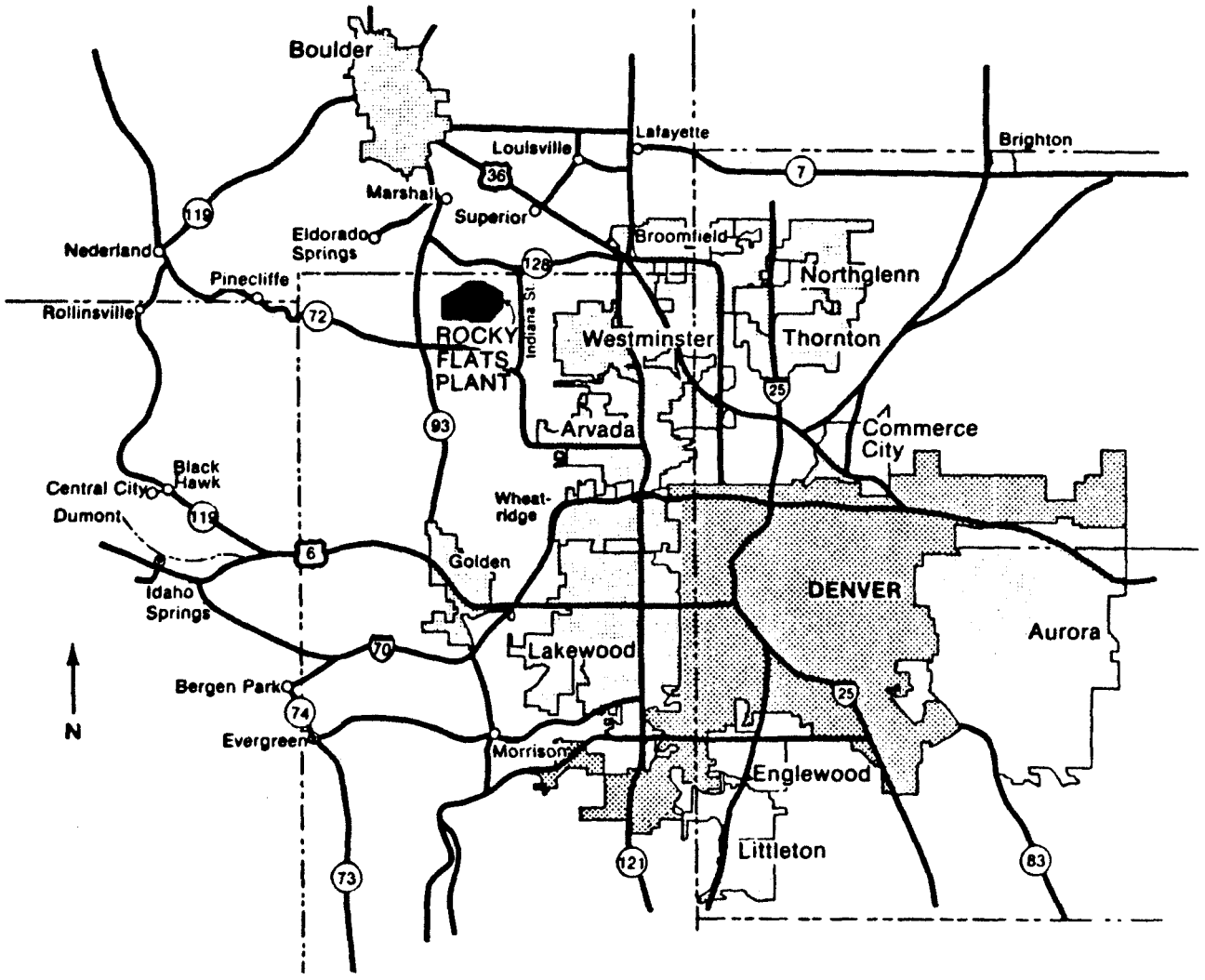
This document has been compiled to achieve the following objectives:

- Describe the activities and strategy for ER&WM activities and DOE/DP environmental activities, with emphasis on FY92
- Foster open communication between DOE and the community
- Demonstrate DOE's emphasis on environmental stewardship and responsible management
- Describe the policies that DOE and its contractors are using to meet waste management and environmental restoration objectives
- Provide a vehicle that can be used to focus public comment on near-term DOE environmental and waste management activities
- Identify technology development activities planned for FY92

1.4 MISSION AND LOCATION OF ROCKY FLATS PLANT

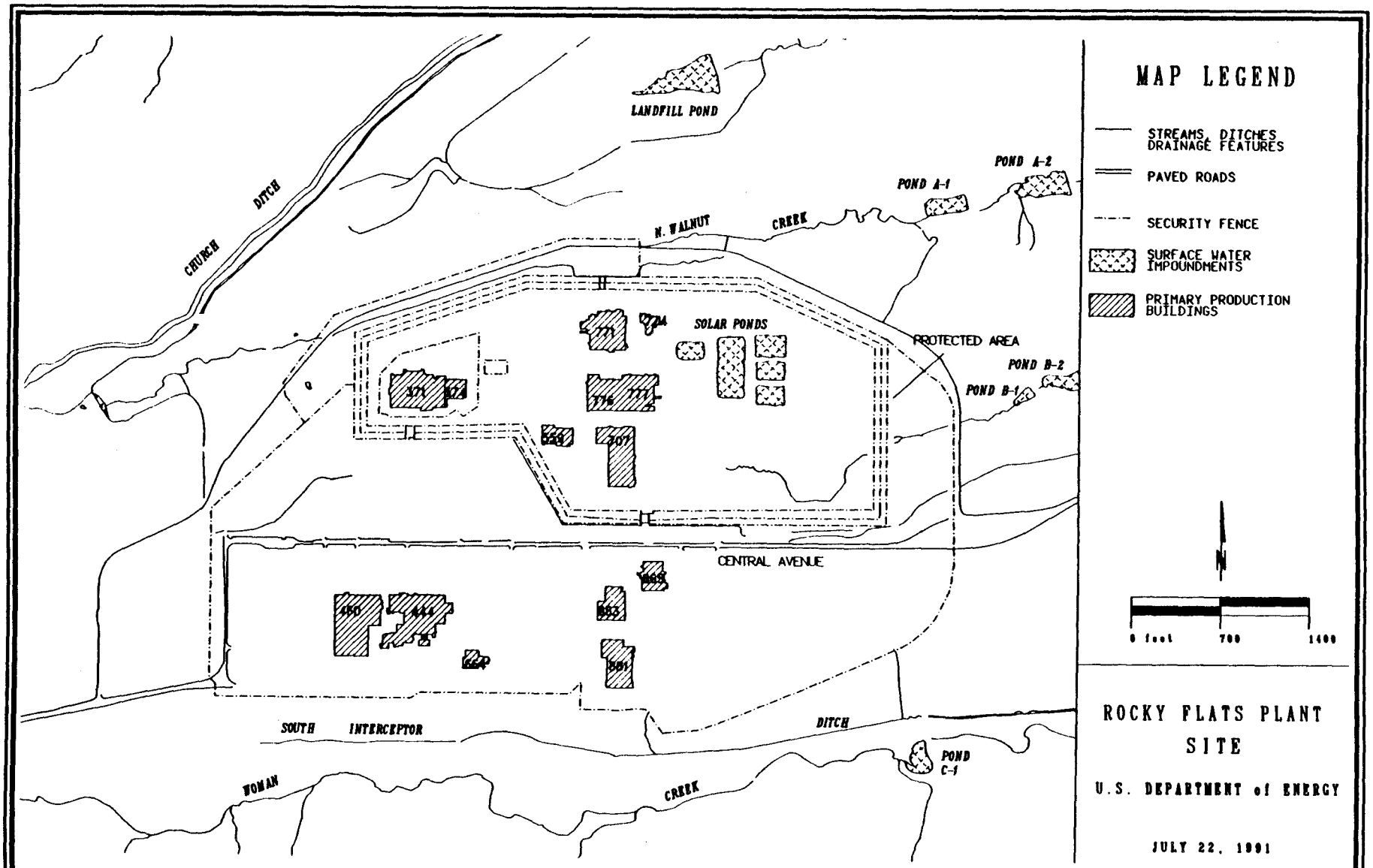
The primary mission of the Rocky Flats Plant is to produce components for nuclear weapons. The final products are component parts manufactured from uranium, plutonium, beryllium, stainless steel, and other metals. Production activities include metalworking, fabrication and component assembly, plutonium recovery and purification, and associated quality control functions. Research and development in the fields of chemistry, physics, materials technology, nuclear safety, and mechanical engineering are conducted to further the plant's mission. The plant was built in 1951 and began operations in 1952.

Rocky Flats is located in Jefferson County, Colorado, at the foot of the Rocky Mountains and approximately 16 miles northwest of downtown Denver. The plant is near the suburban communities of Westminster, Broomfield, and Arvada. The location of the site in relation to Denver and surrounding communities is shown in Figure 1.1. The plant site covers approximately 10 square miles. The Rocky Flats site is shown in Figure 1.2.



Area Map of Rocky Flats Plant and Surrounding Communities

Figure 1.1



Rocky Flats Plant Site
Figure 1.2

1.5 POLICY

The primary objectives of ER&WM programs at Rocky Flats are protection of public health and the environment and compliance with all applicable regulations, DOE Orders, and state and federal agreements and permits (see Section 9 and Appendix C). The FYP details activities at Rocky Flats that will be undertaken between now and September 1997 to ensure that these objectives are achieved. DOE is also considering a policy for future land use, which secures the Rocky Flats site as an ecological preserve. Current operational and future land use policies are discussed below.

1.5.1 Current Operational Policy

It is the policy of DOE to conduct site operations in a safe and environmentally sound manner. Secretary of Energy Watkins has made protection of the environment and the public the top priority for all DOE operations. The result has been a firm commitment to incorporate environmental protection and safety goals into the daily conduct of operations at the site.

It is the policy at Rocky Flats to conduct operations in compliance with both the letter and spirit of applicable environmental statutes, regulations, and standards. Sound environmental management is a top priority for all programs and facilities, with total compliance and environmental cleanup as the ultimate goal.

DOE/RFO contractors also share the responsibility for effective waste and environmental management. EG&G, the Rocky Flats M&O contractor, is required to conduct program and project operations in an environmentally sound manner that is in compliance with applicable regulations and protects the environment and public health.

In addition, it is the site policy to undertake appropriate measures to limit generation of contaminants, wastes, and other residual materials requiring disposal or release to the environment through source reduction and recycling. When generation of such wastes cannot be avoided, actions to reduce waste volume and toxicity through treatment will be taken. Rocky Flats will continue efforts to evaluate, select, develop, and integrate technologies that are safer and more effective than existing treatment methods. It is DOE's and EG&G's goal to increase plantwide awareness at all levels of the need to operate in an environmentally sound manner and to improve pollution prevention measures through training, special campaigns, and incentive programs.

1.5.2 Future Land Use Policy

It is DOE's intent to begin consideration of the future land use of the Rocky Flats Plant site for an ecological preserve. The presence of the Rocky Flats Plant has provided protection

from agricultural use, urban development, and other forms of human impact for the last 40 years. This protection has preserved and enhanced habitats that have been adversely affected by development elsewhere along the Colorado Front Range. For example, there are remnants of tall-grass prairie that once occupied the High Plains but that are now restricted to preserved areas such as the Rocky Flats site. Because the site is situated in the ecotone between the Rocky Mountains and the High Plains, an uncommonly diverse and unusual combination of species exists at Rocky Flats.

Preservation of the Rocky Flats site as an ecological preserve is consistent with that of the U.S. Atomic Energy Commission Environmental Statement on "Land Acquisition: Rocky Flats Plant, Colorado," dated April 1972. Preservation of this type of environment near an urban center will add an important and irreplaceable resource to the communities surrounding Rocky Flats.

1.6 PRIORITIES

To manage the large number of environmental management activities at Rocky Flats, a priority system was developed by DOE to guide activities and support budget requests made in the FYP. This prioritization system is currently being used for Environmental Restoration activities at Rocky Flats. A new prioritization system was developed for Waste Management activities. In addition, a risk-based prioritization system is being developed by DOE for ranking facilities in the DOE complex. These prioritization systems are briefly described below.

Environmental Restoration (DOE/RFO)

Priority 1

Priority 1 activities are those necessary to prevent near-term adverse impacts to workers, the public, or the environment. Examples of this type of activity include containment to prevent the spread of contamination and actions to prevent or minimize releases to the environment. Also included as Priority 1 activities are ongoing activities that, if terminated, could result in significant program and/or resource impacts. Impacts could include increased risk to the environment or to workers, loss of trained staff, or increased costs. The 178 contaminated sites at Rocky Flats have been prioritized and grouped into 16 OUs by DOE, CDH, and EPA as part of the Interagency Agreement (IAG). The 881 Hillside Area (OU 1, comprising 11 sites) and the 903 Pad, Mound, and East Trenches Areas (OU 2, comprising 20 sites) have been designated as Priority 1 in the FYP.

Priority 2

Priority 2 activities are those required to meet the terms of agreements (in place or in negotiation) between DOE and federal, state, and local agencies. These agreements

represent legal commitments to complete activities in accordance with agreed schedules. The OUs were numbered according to the risk associated with them; the highest risk OUs have been assigned the lowest number. The OUs that have been assigned Priority 2 in the FYP are as follows:

OU	Site Grouping	No. of Sites
OU 3	Offsite Releases	4
OU 4	Solar Ponds	1
OU 5	Woman Creek	10
OU 6	Walnut Creek	20
OU 7	Present Landfill	2
OU 8	700 Area	38
OU 9	Original Process Waste Lines	1
OU 10	Other Outside Closures	19
OU 11	West Spray Field	1
OU 12	400/800 Area	12
OU 13	100 Area	15
OU 14	Radioactive Sites	9
OU 15	Inside Building Closures	8
OU 16	Low-Priority Sites	7
SW	Sitewide Activities	0

Priority 3

Priority 3 activities are those required for compliance with external environmental regulations but not captured by Priority 1 or Priority 2. Also included under Priority 3 are actions necessary to reach compliance with DOE Orders that implement external regulations or that set specific DOE regulatory standards, actions that would reduce risks or costs, and actions that would prevent disruption of the DOE mission. No Priority 3 Environmental Restoration activities are currently planned at Rocky Flats.

Priority 4

Priority 4 activities are activities that are not required by regulation but that would be desirable to implement. Examples of Priority 4 actions include complying with DOE Orders that are more stringent than external regulations, implementing good management practices, reducing personnel exposures below levels required by regulations or standards, and accelerating actions to satisfy an agreement or milestone ahead of schedule. No Priority 4 Environmental Restoration activities are currently planned at Rocky Flats.

Waste Management (DOE)

Waste Management activities have been prioritized by DOE/Headquarters to support budget requests. The current Waste Management prioritization is as follows.

Priority Category 1

Category 1 includes activities necessary to prevent near-term adverse impacts to workers, the public, or the environment as well as ongoing activities required to maintain safe conditions or prevent significant impacts to program and/or resources.

Priority Subcategory 1A: Provides safe operation

- Addresses an imminent human health and safety problem or an imminent release that could cause a widespread environmental impact
- Reduces probability of major damage to equipment/facilities to avoid impacts to human health and/or the environment
- Necessary to maintain safe conditions

Priority Subcategory 1B: Prevents potential releases to the environment

- Monitoring and surveillance of waste problems
- Contain, treat, or remove materials that could potentially cause near-term impacts

Priority Subcategory 1C: Maintains ongoing activities

- Completes an activity being conducted to minimize near-term health and safety or environmental impacts for which substantial funding has previously been expended
- Maintains ongoing activities that, if terminated, could result in significant Environmental Management program and/or resource impacts

Priority Category 2

Category 2 includes activities required to meet the terms of formal agreements (in place or in negotiation) between DOE and federal, state, and local agencies. (This category does not include permits or permitting activities.)

Priority Subcategory 2A: Complies with agreement provisions that have criminal or civil liability penalties

- Includes activities necessary to comply with agreement provisions that, if not conducted, could result in criminal or civil liabilities (fines and/or incarceration) imposed through the formal judicial system, i.e., the courts

Priority Subcategory 2B: Complies with agreement provisions that have administrative penalties

- Includes activities necessary to comply with agreement provisions that, if not conducted, could result in an immediate action, normally imposed by the regulatory agency's administrative process, that is less severe than Priority Subcategory 2A

Priority Subcategory 2C: Complies with other agreement provisions

- Includes activities necessary to comply with agreement provisions that, if not conducted, could result in missed milestones or failure to achieve other commitments agreed to by DOE without legal or administrative enforcement impacts

Priority Category 3

Category 3 includes activities required for compliance with (1) external environmental regulations not captured by Categories 1 or 2, (2) activities addressing DOE Orders that implement external regulations or that set specific DOE regulatory standards, (3) activities that would reduce risks or costs, and (4) activities that prevent disruption of DOE's mission.

Priority Subcategory 3A: Complies with external regulations and DOE regulatory standards

- Provides for compliance with environmental, health, and safety regulations, standards, and permits

Priority Subcategory 3B: Maintains supporting activities

- Constructs or maintains supporting activities (e.g., laboratory services) needed to comply with regulations

Priority Subcategory 3C: Provides for long-term mission continuation and cost benefits

- Operations and critical path construction necessary to meet mission requirements.
- Activities initiated to provide long-term cost benefits/savings

Priority Category 4

Category 4 includes activities that are not required by regulation but that would be desirable. Examples include (1) complying with DOE Orders that are more stringent than external regulations, (2) implementing improved management practices, (3) reducing personnel exposures below levels required by regulations or standards, and (4) accelerating actions to satisfy an agreement or milestone ahead of schedule.

Priority Subcategory 4A: Provides supplementary environmental, safety, and health improvements

- Provides for reduction of health and safety or environmental risks that are beyond the reductions mandated by law and/or regulation
- Addresses compliance with DOE standards and requirements that are more stringent than those imposed by law and/or regulation

Priority Subcategory 4B: Improves other practices

- Implements operational and/or management practices that will provide long-term benefits to waste operations

Priority Subcategory 4C: Accelerates schedules

- Provides for acceleration of actions to meet required milestones ahead of schedule

<u>Risk-Based Prioritization (DOE Complex)</u>

Risk-Based Budget Prioritization for environmental restoration activities was initiated in FY91 by DOE as a way of improving the distribution of DOE funding on a national level. Each facility is required to review and prioritize environmental management activities and determine which activities could be performed at maximum, minimum, and intermediate funding levels. Reviews are performed to determine how well the activities reduce risks and

environmental contamination at the facility, increase knowledge of the facility, and comply with regulatory requirements. The environmental restoration priority system developed in the IAG was used to formulate the risk-based prioritization for Rocky Flats.

Rocky Flats has two remediation activities that contribute to risk reduction in FY92. Interim remedial actions at OUs 1 and 2 will reduce risks in FY92 and FY93. OU 15, Inside Building Closures, will contribute to risk reductions in FY93. The majority of the environmental restoration activities conducted at Rocky Flats in FY92 will be characterization activities. These activities will contribute to knowledge of the nature and extent of contaminant geology, hydrogeology, ecology, meteorology, and potential contaminant migration pathways. Characterization reduces uncertainties regarding the fate and transport of possible contaminants at Rocky Flats. Many activities will contribute to fulfillment of the site's regulatory commitment. Only the maximum funding level will be adequate to ensure that all regulatory and agreement commitments are met on schedule.

1.7 MANAGEMENT AND EXTERNAL INTERACTIONS

The roles and responsibilities of organizations performing environmental activities at the site are defined in the following sections. Also, the roles of external agencies are discussed with respect to environmental activities at the site.

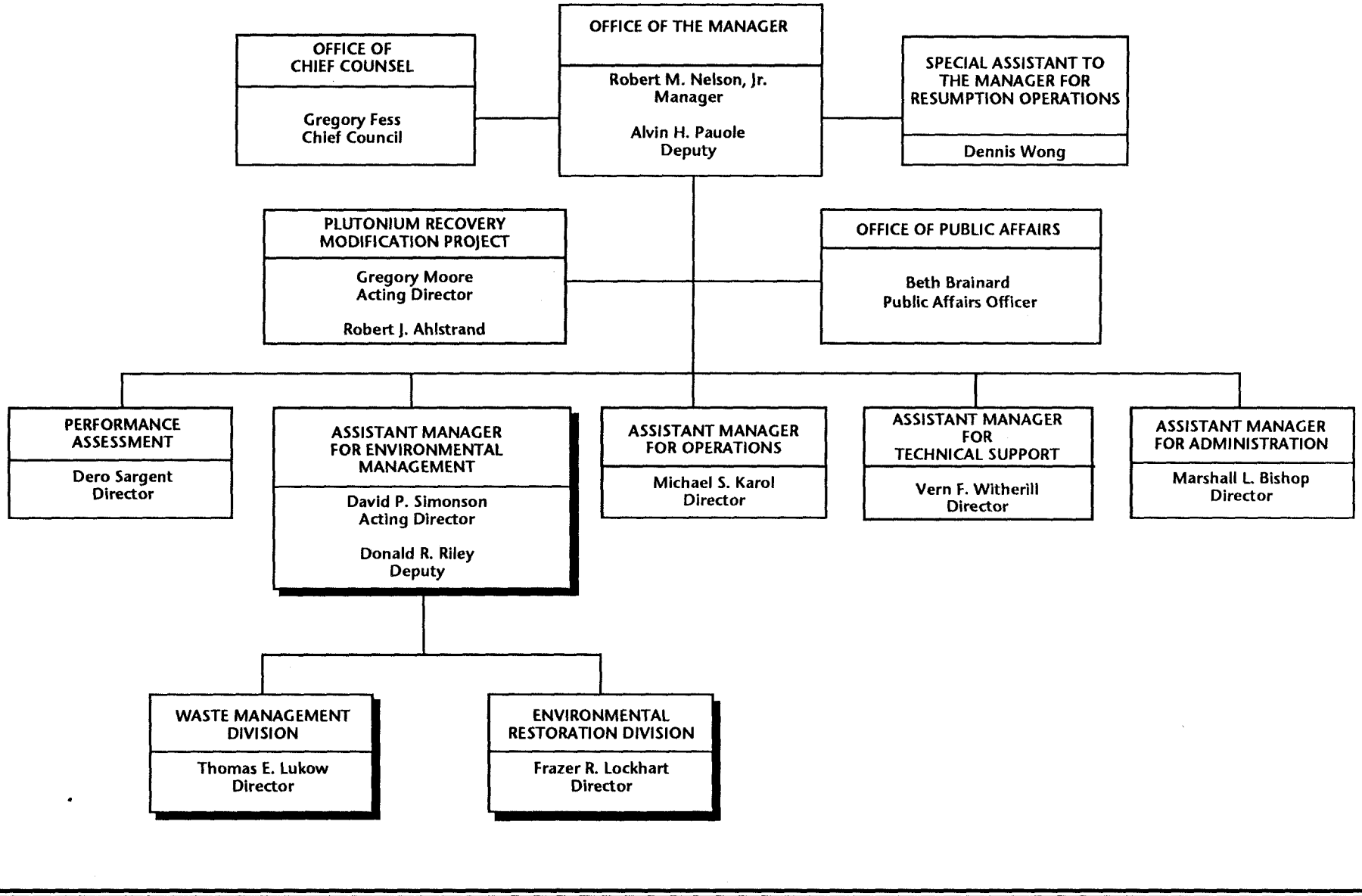
1.7.1 DOE Management Structure and Strategy

DOE consists of line organizations fully responsible for their assigned activities. Operational programs and activities related to environmental and worker protection and public health and safety are included in those responsibilities.

DOE has established operations offices throughout the United States to manage the facilities and programs for which it is responsible. DOE establishes policy by issuing orders and directives. DOE/EM is responsible for (1) providing guidance to and oversight of operations office activities; (2) preparing and issuing top-level plans (with input from operations offices) such as the Rocky Flats FYP; (3) prioritizing and developing budgets, which are based on input from the field; and (4) providing guidance on operations office plans such as the SSP.

DOE/RFO has been assigned the responsibility and authority to manage and administer the M&O contract for management and operation of the Rocky Flats Plant. This responsibility includes all Rocky Flats mission assignments and oversight of the plant's environmental restoration and waste management programs and activities. DOE/RFO prepares and submits budget requests annually to DOE/EM for funding to meet all operating requirements, including environmental restoration and waste management.

Responsibility for environmental restoration and waste management (including preparation of the FYP and SSP) is assigned to the DOE/RFO Assistant Manager for Environmental Management, who reports directly to the Manager of DOE/RFO. Within this office are two divisions: Environmental Restoration and Waste Management. The organizational chart for DOE/RFO is shown in Figure 1.3.



U.S. Department of Energy
Rocky Flats Office
Organizational Chart

Figure 1.3

May 24, 1991

The Environmental Restoration Division is responsible for oversight and management of:

- All National Environmental Protection Act (NEPA) compliance activities
- All environmental assessment, remediation, and restoration activities
- Soil and groundwater investigation and monitoring systems

The Waste Management Division has two branches: Environmental Monitoring and Waste Management. The Environmental Monitoring branch is responsible for oversight and management of:

- Ambient environment monitoring (air, groundwater, surface water, soil, and biota) relative to regulated pollutants
- Monitoring permissible releases to the environment (stack and vent sampling, drainpipes, leachate, storm water, and fugitive emissions)
- Hazardous chemical inventory reporting required for notifying the public and protecting public health or the environment in the event of a release

The Waste Management branch is responsible for managing all site wastes, including hazardous, radioactive, mixed, sanitary, and medical wastes from generation to final disposal. The Waste Management branch is responsible for oversight and management of:

- Waste minimization
- Waste characterization
- Waste certification
- Regulatory compliance
- Storage
- Treatment
- Disposal
- Inventory reporting
- Research and development

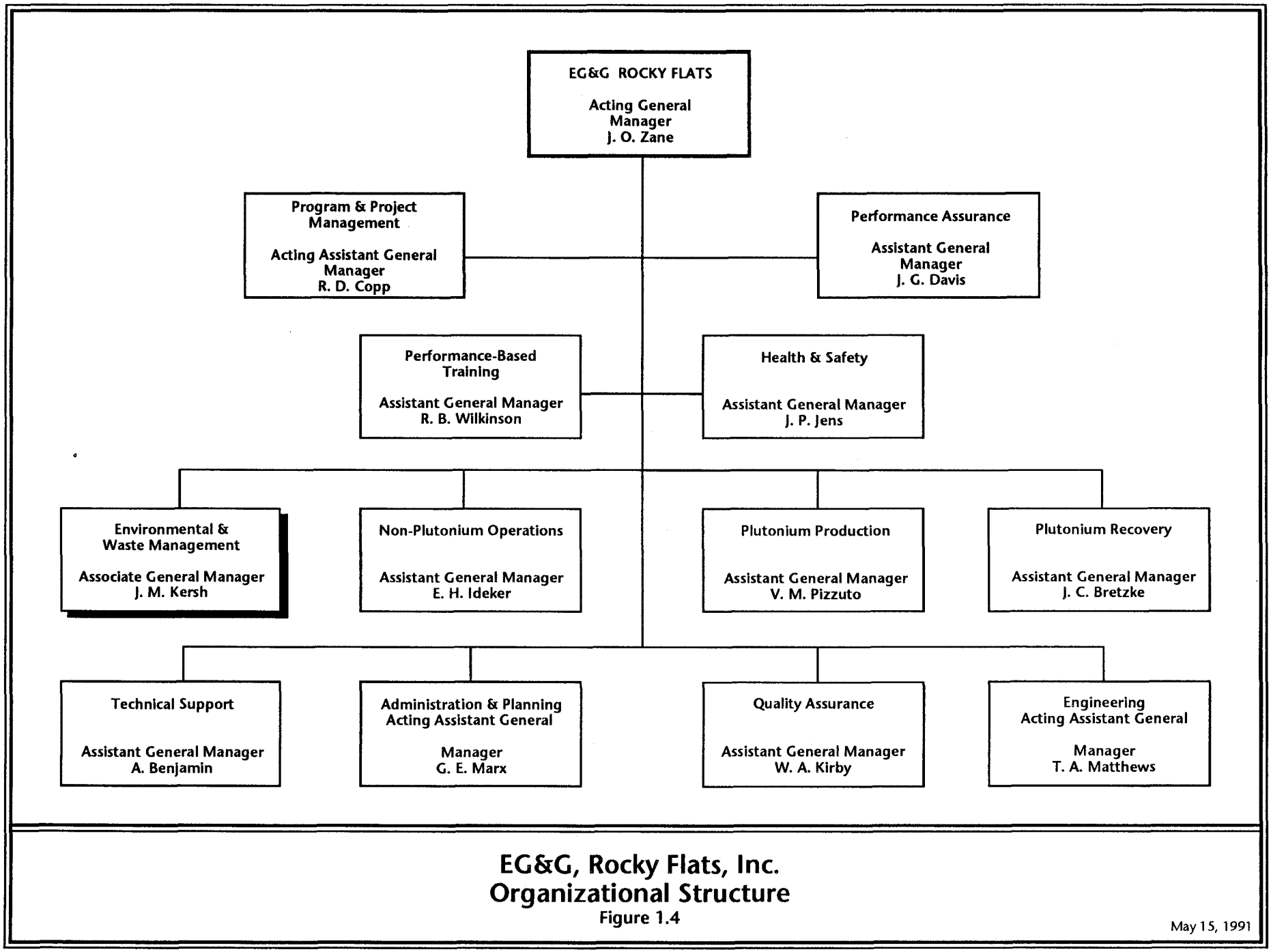
- Management of waste operations facilities/equipment
- Emergency planning and response

1.7.2 EG&G Organization and Responsibilities

1.7.2.1 Organization

EG&G, as prime contractor to DOE, provides support to DOE in the operation of Rocky Flats, including environmental protection and restoration. EG&G is responsible and accountable to DOE/RFO for operation of the site and for implementing the Environmental Restoration and Waste Management programs. In this capacity, EG&G is charged with safe, environmentally sound maintenance and operation of site facilities; facility upgrades; operational support; waste management; and monitoring of operations and effluents for environmental compliance. Operation or building managers have first-line responsibility for operating their assigned facilities in a safe, environmentally sound manner. The EG&G organizational structure is shown in Figure 1.4.

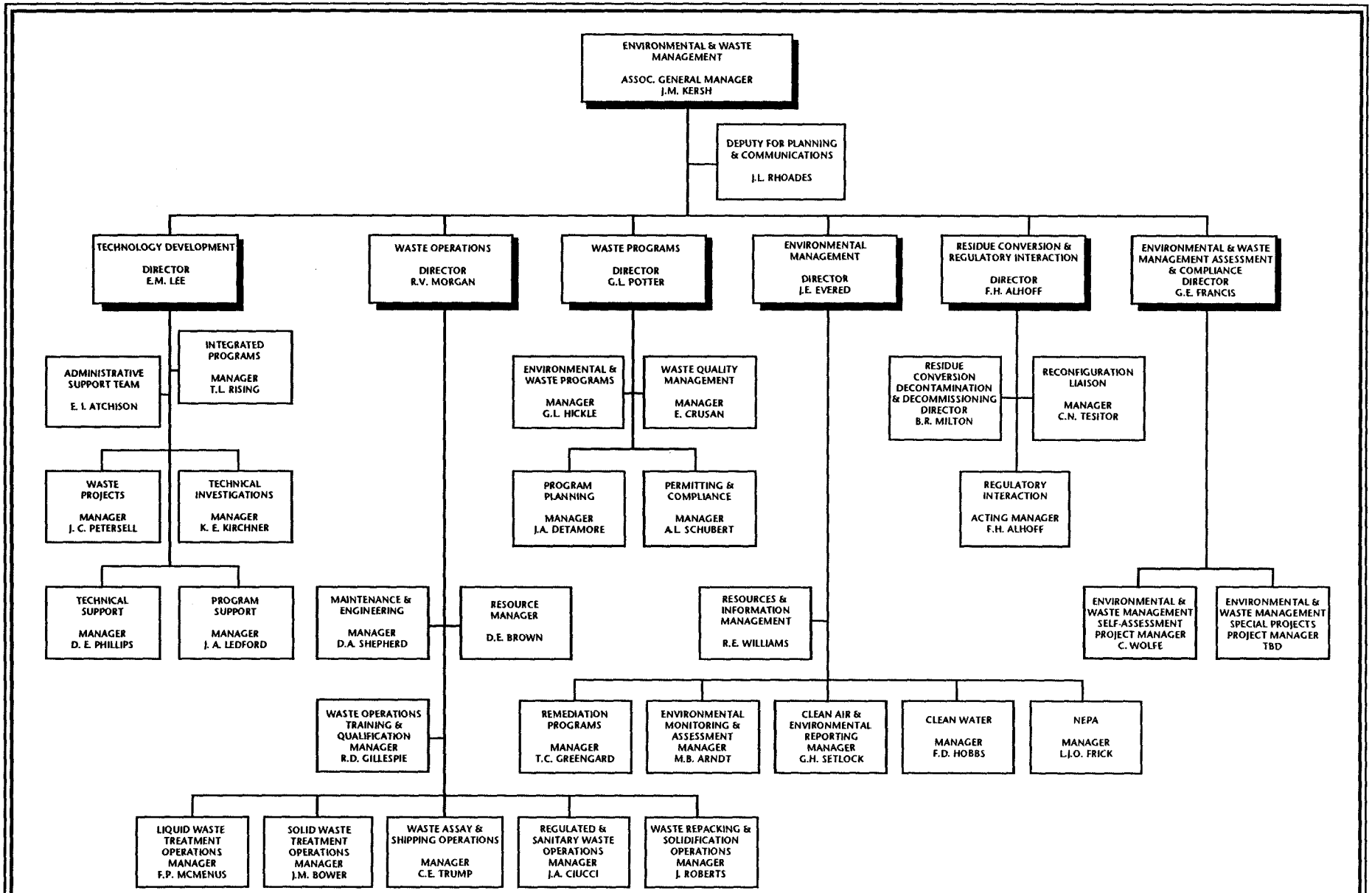
Environmental programs at Rocky Flats are carried out by the Environmental and Waste Management (E&WM) organization, which consists of six directorates: Environmental Management, Waste Operations, Waste Programs, Technology Development, Residue Conversion and Regulatory Interaction, and Environmental and Waste Management Assessment and Compliance. The E&WM organizational chart is shown in Figure 1.5. The Associate General Manager for E&WM reports directly to the Acting General Manager. The organizational responsibilities for each of the groups under the Associate General Manager are delineated in Section 1.7.2.2.



EG&G, Rocky Flats, Inc.
Organizational Structure

Figure 1.4

May 15, 1991



EG&G Rocky Flats
Environmental & Waste Management
Organizational Chart
Figure 1.5

May 24, 1991

Environmental Management (EM)

The Environmental Management directorate oversees remedial actions for active and inactive sites. Environmental Management has six divisions: Remediation Programs, Environmental Monitoring & Assessment, Clean Air & Compliance Reporting, Clean Water, Resources and Information Management, and NEPA. All environmental restoration as well as environmental soil, water, and air sampling and assessment activities are managed under this organization. NEPA support to affected plant programs is also administered through this office.

Waste Operations

Waste Operations is directly responsible for management of waste treatment and storage activities at the site. The organization has eight branches: Liquid Waste Treatment Operations, Solid Waste Treatment Operations, Waste Assay and Shipping, Regulated and Sanitary Waste Operations, Waste Repackaging and Solidification Operations, Maintenance and Engineering, Resource Management, and Waste Operations Training and Qualification. Collectively, these branches are responsible for treatment of all waste streams, shipment of all radioactive wastes, operation of the Crate Counter Facility (which measures radioactive contents of waste drums and crates), and size reduction of solid plant wastes.

Waste Programs

Waste Programs has four branches: Environmental and Waste Programs, Program Planning, Permitting and Compliance, and Waste Management Quality Assurance Environmental and Waste Programs provides program management, project management, and technical support to Waste Operations, Environmental Management, Waste Minimization, and general waste management activities. Program Planning provides program planning, information management, budgeting, and tracking functions for Waste Operations, Waste Programs, and Environmental Management activities. Permitting and Compliance oversees implementation of programs to ensure compliance with environmental laws and regulations. Waste Management Quality Assurance develops standard operating procedures (SOPs), manages the E&WM training program, and develops and administers quality assurance programs for Waste Operations and Waste Programs.

Technology Development

Technology Development is responsible for evaluation, selection, development, and transfer of integrated technologies necessary for the site to satisfy environmental and waste management requirements. Technology Development has the following divisions: Integrated Programs, Waste Projects, Technical Investigations, Technical Support, and Program Support.

Residue Conversion and Regulatory Interaction

This new directorate is responsible for all activities in the areas of residue elimination, project definition, decontamination and decommissioning planning, and regulatory interactions, including support to DOE/RFO in the negotiation of regulatory agreements and to all EG&G activities in support of DOE's reconfiguration initiative.

Environmental and Waste Management Assessment and Compliance

The Environmental and Waste Management Assessment and Compliance group provides internal compliance audits/assessments for the operational groups at the plant. This group performs operational readiness reviews, safety audits, and review of quality assurance programs. Its primary function is to assist in identification of compliance deficiencies and remedies, developing a proactive role for the compliance matrix at the plant.

Other EG&G Rocky Flats Organizations

The functional organizations described above also receive support from other EG&G organizations. These major support organizations include Maintenance, Quality Assurance (laboratory analysis and quality inspections), Health and Safety (radiological and personnel protection), Performance-Based Training, Safeguards and Security, Engineering (plant modification design, project management, and facility configuration management), and Administration and Planning (communications).

Outside Contract Support

Outside support from technical support contractors specializing in environmental restoration, radioactive and hazardous waste management, engineering, and laboratory services are also used to supplement the EG&G staff. A significant amount of the work described in this plan is performed by subcontractors, who are required to comply with applicable plant policies and government regulations. Examples of subcontractor support activities include fieldwork, remedial investigations, support of NEPA documentation activities, project controls, program planning, operational readiness reviews, safety analyses, and RCRA permitting.

Personnel Training

All personnel who perform or supervise the handling of fissile materials are required to undergo training in the handling and understanding of fissile material characteristics. All nuclear workers receive formal training in nuclear safety, radiation safety, industrial safety,

and hazardous materials handling and shipping. Two types of classroom training in radioactive waste management are provided, one specific to employees working with transuranic waste and one specific to employees working with low-level waste. On-the-job training provides specific waste management training in the individual's work area. In addition, all operating procedures are written to comply with the regulations and guidelines established by the various government agencies with regard to the handling of radioactive waste.

Persons directly and indirectly responsible for handling RCRA-regulated wastes (mixed or hazardous) are required to complete a training course that details safe management of hazardous wastes; requirements for record keeping associated with the accumulation, treatment, storage, inspection, and shipment of these wastes; and response to emergency situations. On-the-job training specific to an employee's work area is provided by first-line supervisors. Managers, supervisors, and employees have completed Superfund Amendments and Reauthorization Act (SARA)/Occupational Safety and Health Administration (OSHA) training for hazardous waste site activities in compliance with 29 CFR 1910.120.

1.7.3 Interaction with Offsite Agencies and Organizations

Several external federal, state, and local agencies are responsible for enforcing environmental regulations at the site. Principal among these agencies are EPA and CDH. These agencies issue permit review compliance reports, participate in joint monitoring programs, inspect facilities and operations, and/or monitor compliance with applicable regulations and permits.

EPA develops, promulgates, and enforces environmental protection standards and regulations as directed by federal statutes. In cases where regulatory authority can be delegated, EPA delegates authority to CDH for state programs that meet or exceed EPA requirements (e.g., RCRA). Where regulatory authority is not delegated (e.g., Comprehensive Environmental Response, Compensation and Liability Act [CERCLA]), EPA Region VIII (which includes the State of Colorado) is responsible for reviewing and evaluating compliance with EPA regulations as they apply to the site. This includes interpreting regulations, consulting with DOE to aid implementation of regulations, inspecting facilities and operations at the site, and assisting appropriate state agencies in regulating operations at the site.

Other external organizations are also involved in environmental activities, including:

- U.S. Department of Transportation (DOT), which regulates interstate transport of commodities, hazardous substances, and hazardous waste
- OSHA, which regulates workplace health and safety

- CDH, which monitors air, soil, and water conditions onsite and offsite and regulates RCRA under the Colorado Hazardous Waste Act (CHWA)
- Governor's Scientific Panel on Monitoring Systems, which evaluates and recommends monitoring systems
- Rocky Flats Environmental Monitoring Council, a group that helps inform the public regarding plant activities; members are appointed jointly by the Governor of Colorado and the Congressional member from the 2nd Congressional District
- U.S. Department of the Interior
- Natural resources co-trustees under CERCLA, which are the U.S. Fish and Wildlife Service, the Colorado Attorney General, the Colorado Department of Natural Resources, and CDH

These external organizations (specifically CDH and EPA) and DOE have entered into several important agreements that outline the steps to be taken to reach compliance with certain applicable environmental regulations.

The IAG, which was signed on January 22, 1991, is an agreement negotiated between CDH, EPA, and DOE that outlines the regulatory roles of EPA and CDH, defines the interaction of the three parties, and defines the schedule of review deliverables and environmental restoration milestones to be accomplished.

The FFCA for LDR wastes allows Rocky Flats to continue producing waste forms that do not meet RCRA LDR regulations provided that the plant is actively pursuing technologies to treat these wastes to meet LDRs. A two-year extension of this FFCA was signed on May 10, 1991.

1.7.4 Public Involvement

RCRA and CERCLA regulations include provisions for public involvement in waste management and environmental restoration, respectively. The IAG integrates these provisions and supplements them with additional community relations requirements. Also, public involvement requirements are established for actions under NEPA jurisdiction. DOE is committed to involving the state, local governments, and the public in planning and implementation of ER&WM initiatives beyond statutory requirements. Public review of and comment on the SSP are part of this effort.

Rocky Flats has developed a Community Relations Plan to meet the public information and involvement requirements of RCRA, CERCLA, CHWA, and the IAG. The Community

Relations Plan addresses the concerns and interests of the surrounding community, as identified through a series of interviews with almost 100 representatives of the community.

The Community Relations Plan was submitted for public review on January 22, 1991. A responsiveness summary will be issued in June 1991. The plan will be fully implemented during FY91.

The following public information and involvement activities have been incorporated into the Community Relations Plan:

- Rocky Flats responds to citizen queries and requests for information regarding to the site on a daily basis.

- A public reading room, containing historical and current documents and articles pertaining to Rocky Flats, is maintained at the Front Range Community College Library in Westminster, Colorado. The reading room is a repository for plans, studies, and reports generated under CERCLA and RCRA remediation processes; planning documents such as the SSP and FYP; and various other reports and documents as requested by the public. Members of the public are encouraged to use the reading room for research and document review. Public documents released by Rocky Flats are also available at the Rocky Flats Environmental Monitoring Council in Golden, Colorado; at both CDH and EPA offices in Denver, Colorado; and at the Boulder Public Library in Boulder, Colorado. Additional information regarding the Front Range Community College Reading Room and the public document repositories, including their addresses and hours, is included in Appendix D.

- Public meetings are conducted to inform the community of site activities. In addition, site personnel meet frequently with federal, state, and local government officials, businesses, schools, and other organizations upon request to discuss issues of interest to the community.

- Written and oral public comment on site documents is solicited regularly as a means of incorporating citizen input into site plans and actions.

- A mailing list of individuals and organizations who receive meeting announcements, notices of document availability, fact sheets, and other information is maintained. The mailing list currently includes more than 1,600 entries.

- A public tour program allows members of the public to visit the site and to talk with experts regarding ER&WM and other activities.

- A speakers' bureau provides the community with experts to address a variety of Rocky Flats topics.

- Rocky Flats publishes a bimonthly newsletter that describes environmental restoration progress and plans. This newsletter is provided to each individual and organization on Rocky Flats's mailing list. Interested parties can be added to the mailing list by contacting Rocky Flats.

- News releases are issued periodically to inform the public of activities and events at the site.

- Employees receive information regarding the site through a series of internal publications, public announcements, and meetings with managers.

1.8 FUNDING SUMMARY

Environmental management activities at Rocky Flats are funded by both DOE/DP and DOE/EM. DOE/EM provides funding for specific activities within the Corrective Activities, Environmental Restoration, Waste Management, and Technology Development programs. Other activities within these programs are considered basic to the Rocky Flats production operations (e.g., ambient air monitoring and permitting activities) and are funded by DOE/DP.

Summary funding levels for these activities are presented in Table 1.1., which reflects the requested FY92 funding levels as of March 25, 1991, based on the President's Budget. FY92 funding on the ADS level is presented in Appendix A. These funding levels may change slightly through FY92 as program requirements are revised.

Funding requirements for FY93-FY97 have been estimated and are shown in the FY93-97 FYP. Funding requirements are given for two funding levels. The first level, the "Preliminary Unvalidated Case" (formerly Case 1), reflects the funding necessary to meet minimum regulatory requirements. The second level, the "Validated Target Level" (formerly Case 2), is a DOE/EM mandated, financially constrained level. The FY93-97 FYP also contains the schedules associated with both funding levels. The actual funding level should fall between these two funding levels.

Table 1.1: FY92 Funding Summary
(in thousands of dollars)

CATEGORY	FUNDING SOURCE	FUNDING LEVEL
Corrective Activities	DOE/EM	$ 1,686
Environmental Restoration	DOE/EM	50,000
Base Environmental	DOE/DP	100,434
Waste Management	DOE/EM	103,481
Base Waste Management	DOE/DP	70,355
Technology Development	DOE/EM, DOE/DP	20,478
Total		$346,434

1.9 PLANNING PROCESS

The basic planning tool used for ER&WM activities is the ADS. ADSs include an activity description, milestone schedule, funding requirements by fiscal year, priority rationale, and consequences if the activity is not pursued. ADSs are prepared in accordance with guidance provided by the DOE/EM FYP Program Office. Reviews are held periodically with DOE/ Headquarters. Preparation of the ADSs coincides with the annual budget submittal, as they provide the detailed basis for determining funding requirements.

Estimates contained within an ADS are formulated using (1) engineering estimates for capital equipment and construction requirements and (2) functional organization estimates for operating costs, based on both historical and planned efforts.

ADSs have previously been the basis for the SSP and the FYP. An additional pre-planning methodology referred to as "Roadmap" was added in FY91. All three documents are updated annually. The SSP addresses planned activities and programs for the next fiscal year. The FYP addresses planned activities and programs for a five-year period. Separate Roadmaps are being prepared for environmental restoration, surface water, groundwater, air, and six waste types. Each Roadmap is developed through a process of assessment, strategic analysis, and issue resolution planning. The end product reflects the current status for the category and outlines the course of action necessary to meet upcoming requirements and overcome foreseeable obstacles. The Roadmap process is used to ensure that important actions are being addressed in the ADSs.

Information contained within each ADS is supported by a detailed activity network. Each activity within the network is scheduled, and the required resources are identified.

Performance measurement of funded activities is accomplished through the cooperative efforts of various EG&G organizations. EG&G is currently developing a comprehensive Performance Measurement System to report actual performance against planned budget and schedule. The ADS will be the basis for this comparison.

1.10 FEDERAL BUDGETING PROCESS

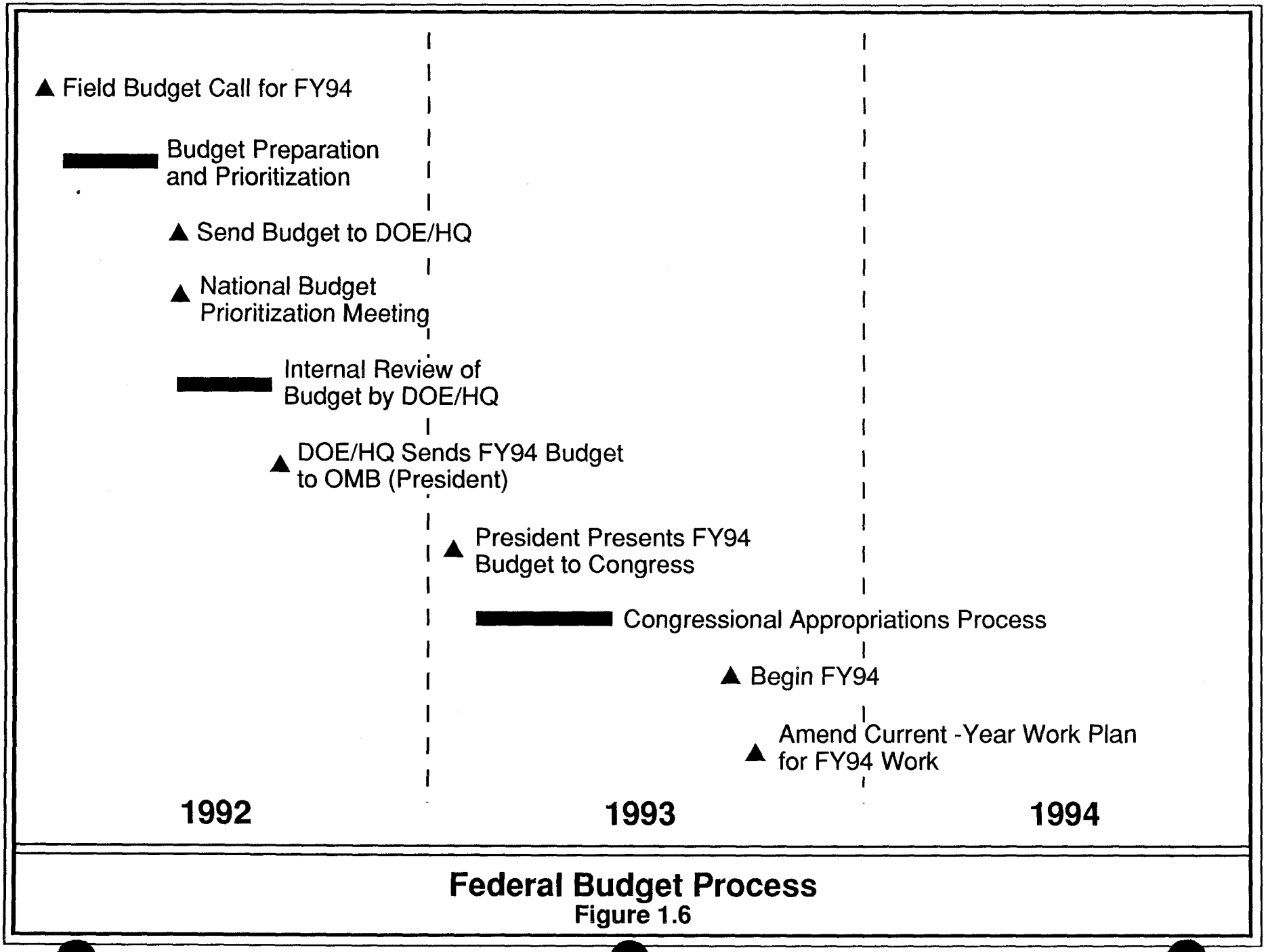
Funding requests must be submitted to the Office of Management and Budget (OMB) two years before funding is actually required. If the project is scheduled to begin in FY94 (the fiscal year runs from October 1 through September 30), the request for funding must be submitted two years prior (FY92). This process is described below.

ADSs are the core of the planning process and constitute the FYP. The FYP is the basis for the DOE-proposed ER&WM budget submitted to OMB. Following OMB approval, the budget is referred to as "the President's Budget." The budget is submitted to the Congressional subcommittees, who discuss the budget and make recommendations to Congress for appropriations.

After Congressional approval, the federal budget is returned to the President, who can either approve or veto it. When a budget is approved, it is processed through OMB to DOE, where program funding levels are established. If approved, funding is generally granted two years after it is requested. A timeline of the budget process is shown in Figure 1.6.

1.11 PLAN ORGANIZATION

The remainder of this SSP is divided into nine major sections. Sections 2.0 through 6.0 present Rocky Flats activities in the categories of Corrective Activities, Environmental Restoration, Waste Management, and Technology Development. Section 7.0 provides a discussion of Quality Assurance. In Section 8.0, key assumptions used in planning are reviewed. Section 9.0 lists joint agreements between DOE and/or EPA and CDH. In Section 10.0, an overview of the NEPA process is presented.



Federal Budget Process
Figure 1.6

2.0 CORRECTIVE ACTIVITIES

2.1 PROGRAM SUMMARY

Corrective Activities are those activities necessary to bring active and standby facilities into compliance with federal, state, and local regulations with respect to air, surface water, and groundwater. Because they specifically address out-of-compliance conditions regarding near-term threats to air or water, Corrective Activities have been assigned the highest priority (Priority 1) of all E&WM activities at Rocky Flats. All of the open Corrective Activities at Rocky Flats Plant involve air emissions, and the major regulatory drivers are the Clean Air Act, the Air Pollution Emission Notice (APEN) settlement agreement between DOE and CDH, Tiger Team Audit Findings, DOE Orders, and State of Colorado Air Quality Control Commission (AQCC) regulations. Corrective Activities follow a life cycle consisting of identification, evaluation, funding, implementation, and closeout. When an activity becomes repetitive or routine, it is no longer considered a corrective activity and the program is shifted to the appropriate operational organization. Corrective Activities are funded for the initial years through the FYP but are shifted to Base Programs (DOE/DP funding) when the task becomes a routine operations function or when compliance is achieved.

Compliance deficiencies are identified through various review processes, including DOE/ Headquarters Tiger Team audits, environmental surveys, DOE field office audits, contractor audits, and audits conducted by the state and regulatory agencies. Responses to deficiencies are developed in consultation with regulatory agencies and, in some cases, may be included in negotiated agreements. If noncompliance is identified, action plans are developed for achieving compliance. These plans include actions related to permit development, technology assessment and direction, facility changes, proposed budgets, and schedules. Corrective action plans are reviewed by the regulators, modified as appropriate by DOE, and approved as part of the yearly planning process. Funding requirements are included in the FYP and are updated annually. None of the Corrective Activities extend into FY93.

Because Corrective Activities must be completed in a timely and effective manner to protect public health and safety and the environment, these activities will generally be accomplished by the application of existing technologies rather than new technologies that would require lead time for development.

2.2 AIR EMISSIONS

The activities described in this section are required to bring active and standby facilities into compliance with existing regulatory requirements, the Clean Air Act (CAA), DOE Orders, and pertinent agreements (e.g., the AIP). The site is currently in compliance with most federal and state regulations for air quality; however, several projects are needed to maintain that position.

2.2.1 VOC Monitoring (ADS #82)

The AIP requires volatile organic compound (VOC) monitoring to allow measurement of Rocky Flat's impacts on surrounding (offsite) ambient air. CDH, DOE/RFO, and EG&G have determined that CDH will operate and maintain a sampling network. On this basis, the corrective activity has been discontinued.

2.2.2 Upgrade Radioactive Stack Sampling (ADS #83)

In 40 CFR 61.93(b), National Emission Standards for Hazardous Air Pollutants (NESHAP) stack monitoring requirements for radionuclides are established. The December 15, 1989, rulemaking specifies use of 40 CFR 60 Appendix A, EPA Method 1, for sample site location and continuous monitoring following Appendix A of American National Standards Institute (ANSI) N 13.1. Prior to this rulemaking, DOE Order 5400.1 and DOE guidance document "Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance" (formerly DOE Order 5400.XY) specified similar requirements. As noted in the Tiger Team Audit findings, radioactive stack sampling locations are not in accordance with Method 1 and do not sample isokinetically.

Existing plant radioactive surveillance equipment and operations are currently being evaluated and discussed in compliance agreement negotiations with EPA Region VIII to achieve full compliance with NESHAP stack monitoring requirements. Stack upgrade studies (as-built drawings of stack monitoring locations) will be completed. Velocity profiling locations will be determined according to EPA guidance. Pending negotiations with EPA, Base Programs supported equipment may require extensive upgrades, including replacing flow rate totalizers, sampler locations, and filter holders.

Implementation (installation) activities are funded in Base Programs ADS #5083 for FY93-FY97.

2.2.3 Prepare Air Pollution Emission Notices (ADS #108A, #108B, [funded by WM], and 5108 [funded by DOE/DP])

Colorado Air Quality Regulation No. 3 requires submittal of an APEN for any criteria pollutant emission source that could emit 1 ton/year (uncontrolled emissions) or sources emitting 1 pound/day or 0.175 ton/year of hazardous, toxic, or odorous pollutants. This requirement applies to processes (not only exhaust vents), without consideration of the numerous contributing vents. In FY91, Rocky Flats will complete an air emissions inventory and APEN preparation effort to meet this requirement. Rocky Flats must prepare, submit, and revise APENs for 104 production and support buildings and numerous storage tanks.

Preparation of the initial set of APENs in FY91 will be funded under Corrective Activities and Waste Management. Thereafter, the annual updates and maintenance of APENs and the submittal of renewal fees will be performed and funded under Base Programs.

2.2.4 Survey and Identify Existing NESHAP Emissions (ADS #109)

Identification of NESHAP emission sources is required under 40 CFR 61.10 and Colorado Air Regulations Nos. 1, 3, and 8. Radionuclides are further addressed in 40 CFR 61.91. ADS #109 includes efforts, beginning in FY92, to identify sources of NESHAP emissions, including beryllium and various isotopes of radionuclides. The procedure for monitoring beryllium has been modified to comply with NESHAP and Colorado air pollution control regulations in accordance with the Tiger Team Audit findings. EPA compliance sampling for beryllium is currently on hold because of plant shutdown. Within 30 days after resumption of 80 percent of beryllium processing, a one-time stack sampling study for beryllium will be performed. If this sampling is required in FY91, it will be funded under Base Programs ADS #5014.

2.3 WATER PROGRAMS

The water sampling and treatment activities that were previously included in Corrective Activities have been moved into Base Programs for FY92 because they consist of ongoing or routine activities and no longer address out-of-compliance situations. Sampling and Analysis of Surface Waters (formerly ADS #110) is now included in ADS #5019, and Effluent Treatment (formerly ADS #112) is now included in Base Programs ADS #5112.

3.0 ENVIRONMENTAL PROGRAMS

A discussion of the environmental restoration processes for contaminated sites and the specific application of these processes at Rocky Flats is presented in this section. The following are provided herein: (1) an overview of DOE's environmental restoration program at Rocky Flats, (2) a description of the regulatory framework within which this program is being implemented, (3) a discussion of the implementation of the RCRA and CERCLA processes at Rocky Flats, (4) descriptions of remedial actions planned for implementation at Rocky Flats, including accomplishments and activities planned for FY92.

3.1 ENVIRONMENTAL RESTORATION OVERVIEW

The Rocky Flats Environmental Restoration Program is part of the national DOE Environmental Management Program, which was established to identify and clean up inactive waste sites at DOE facilities. Specifically, the program includes site identification and characterization, remedial design and cleanup action, and post-closure activities at inactive radioactive, hazardous, and mixed-waste sites. The primary objective of DOE's Environmental Restoration Program is to clean up these sites in compliance with applicable federal and state environmental laws and regulations while maintaining the health and safety of the public and workers.

To meet this objective, Rocky Flats must (1) identify all remedial actions needed to clean up contamination resulting from past Rocky Flats activities and (2) provide an identifiable, coherent program through which all activities supporting the Environmental Restoration Program can be coordinated and reported. DOE's overall strategy for achieving its goal of cleaning up Rocky Flats within 30 years (by 2019) includes the following:

- Identify inactive contaminated facilities and sites
- Assess these facilities and sites to determine the nature and extent of contamination
- Confine and contain existing contamination to the extent necessary to minimize its further migration
- Prepare detailed work plans (approved by regulatory agencies) for investigation and cleanup of these facilities and sites
- Ensure that cleanup is carried out in strict accordance with approved work plans
- Implement long-term monitoring programs to ensure continuing compliance

3.2 REGULATORY FRAMEWORK

Remediation of DOE sites must be performed in compliance with applicable federal and state environmental laws and regulations. Before the enactment of the current federal environmental legislation, DOE managed waste storage and disposal under requirements established by authority of the Atomic Energy Act. In response to new regulations (primarily NEPA, RCRA, and CERCLA), DOE has established programs to achieve compliance with these environmental laws as they pertain to (1) generation, treatment, storage, disposal, and transportation of wastes produced in operating facilities and (2) waste characterization and cleanup at non-operating (inactive) sites.

The principal regulatory requirements for remedial actions are those derived from NEPA, RCRA, and CERCLA (as amended by SARA). These federal regulations require that hazardous waste sites and hazardous chemical spills and releases be investigated and cleaned up. Both CERCLA and RCRA contain similar guidance on the way that remedial activities must progress. The primary component of the CERCLA process is the Remedial Investigation/Feasibility Study (RI/FS); the primary component of the RCRA process is the RCRA Facility Investigation/Corrective Measures Study (RFI/CMS). Rocky Flats is currently performing both CERCLA and RCRA activities; therefore, both RI/FS and RFI/CMS activities are being conducted. The generic RI/FS and RFI/CMS processes at Rocky Flats are described below.

CERCLA (also known as "Superfund"), as amended by SARA (CERCLA's re-authorization), provides for investigation and cleanup of sites on the National Priorities List (NPL), which is EPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for cleanup under Superfund. EPA is empowered by Superfund to recover costs for investigations and remediation or to persuade the parties who have allegedly contaminated the site to perform the investigation and cleanup under EPA oversight. Sites are added to the NPL in several ways, including the following: (1) the site is nominated by the state for reasons such as identification of a threat to human health; (2) contaminant spills or releases are reported to the National Response Center, resulting in an EPA investigation of the site; or (3) the site has a Hazard Ranking of greater than 28.5, based on information from reports and investigations to determine the level of threat to human health. As of February 1991, the NPL included 1,073 sites, including Rocky Flats.

3.2.1 CERCLA Remedial Investigation/Feasibility Study Process

The RI/FS process under CERCLA has been established to characterize the nature and extent of potential risks at hazardous substance sites and to evaluate treatment alternatives for those sites. Implementation of an RI/FS is a dynamic and flexible process that can be tailored to address the specific problems of each site. The RI/FS process is designed to accommodate new information, new direction, and new technologies as they become

available. An RI/FS may be conducted by EPA, the state, the past or present owner/operator, or by a combination of regulatory agencies and owner/operators.

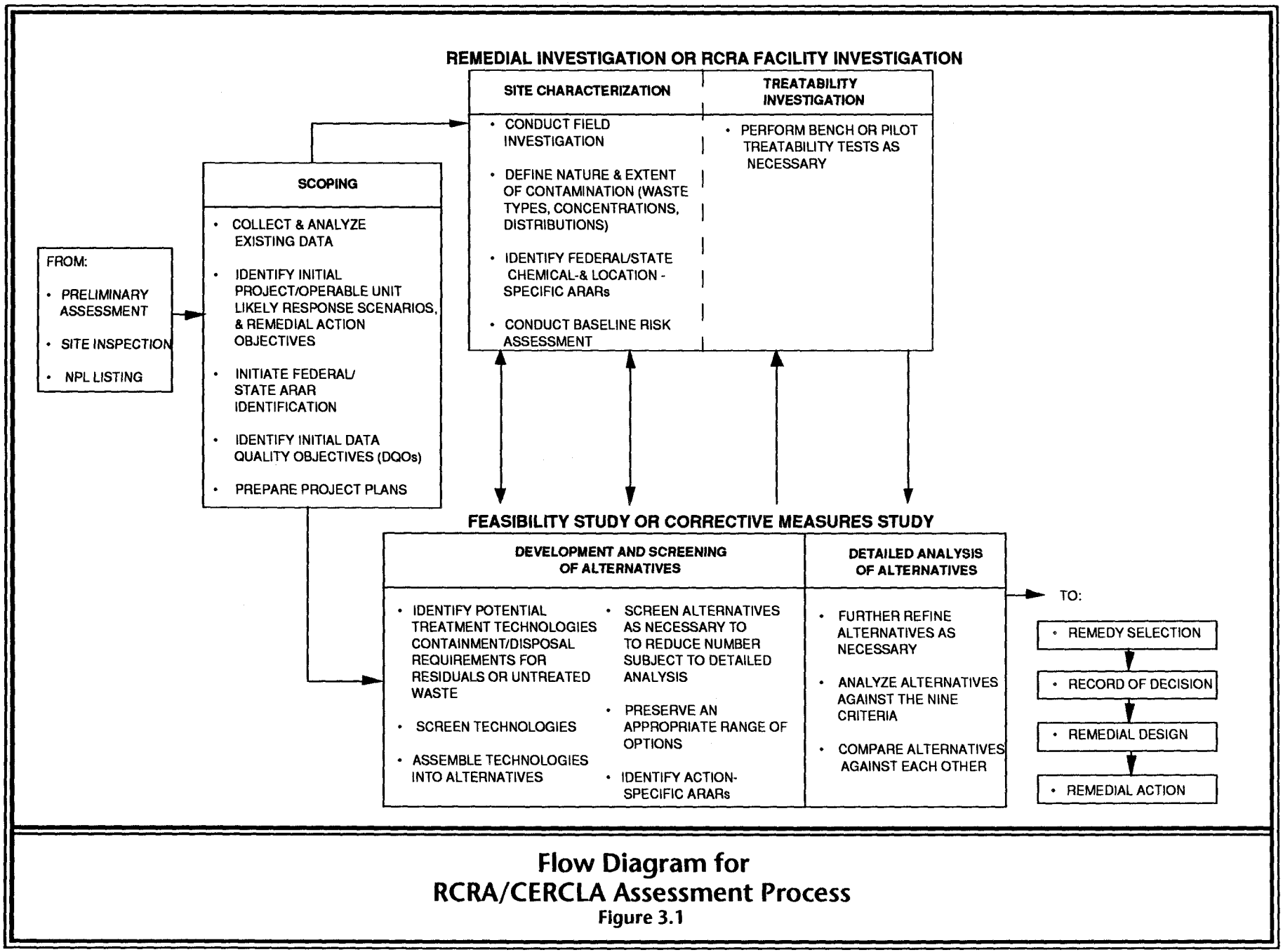
EPA guidelines for the RI/FS process, as set forth in "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA" (available at the EPA Region VIII Library in Denver, Colorado) are discussed below. The RI/FS process specific to Rocky Flats is discussed in Section 3.3.4.

An RI consists of characterization of the nature and extent of contamination and evaluation of any risks that the site may pose to human health or the environment. Information collected and analyzed during the RI is utilized in the FS, which consists of evaluation of remedial treatment alternatives on the basis of their technical and cost effectiveness and recommendation of treatment alternatives or the "no action" alternative (if risks are determined to be below levels of concern to public health and safety).

The RI/FS process incorporates the following components:

- Scoping
- Remedial Investigation
- Feasibility Study
- Remedy Selection and Remedial Action

The generic RI/FS process is illustrated in Figure 3.1. In general, EPA or the designated agency (hereafter, collectively called the "regulatory agency") takes the lead on the scoping process, the owner/operator of the site performs the RI and FS, and the regulatory agency selects the remedy.



Flow Diagram for
RCRA/CERCLA Assessment Process
Figure 3.1

Scoping the Remedial Investigation/Feasibility Study

The scoping process focuses the RI/FS process by outlining the goals and objectives of the study, defining the data quality objectives (DQOs) to be met during the investigations, and preliminarily identifying applicable regulations. Scoping also helps to streamline the process by identifying, early in the process, the direction that the program will take, thus allowing activities to begin as soon as possible.

The goals and objectives of the RI/FS are defined by the regulatory agency and are identified by the initial assessment of site problems. The scoping of an RI/FS has the flexibility to allow additional data and new decisions to be incorporated.

The scoping activities that are performed to give the RI/FS further direction and guidance are summarized as follows:

(1) Evaluation of Existing Data and Development of Conceptual Site Model

All available information regarding past and current waste handling and disposal practices, site history, biology, geology, hydrogeology, and demographics, is collected and analyzed to characterize current site conditions. These data are used in developing the conceptual site model, which describes contaminants, their sources, and potential migration pathways. This model assists in identification of sampling locations and possible remedial alternatives. In addition, the site conceptional model may identify the need for immediate remedial action.

(2) Identification of Initial Project and Operable Units, Likely Response Scenarios, and Remedial Action Objectives

After the conceptual model has been developed, sites can be divided into workable portions called operable units (OUs). In 40 CFR 300.6, an OU is defined as "a discrete part of the entire response action that decreases a release, threat of release, or pathway of exposure." OUs may be defined as geographic areas, areas with similar contamination, or contaminated media (e.g., soil or surface water).

(3) Initial Identification of Applicable Federal and State Regulations

Applicable or Relevant and Appropriate Requirements (ARARs) are identified at several stages during the RI/FS. The scoping process includes initial identification of federal and state regulations that may apply to the site and its cleanup. ARARs are further defined later in the RI/FS process.

(4) Identification of Initial Data Quality Objectives

DQOs specify the type and quality of data needed to support the RI/FS process. Given the dynamic nature of the RI/FS process, DQOs may change as a result of new site information.

(5) Identification of Additional Data and Treatability Study Requirements

The need for additional data and treatability studies may be determined during the scoping process. The types and quantity of data necessary for the RI/FS are identified so that data collection and data management plans can be developed. Based on the initial data evaluation, the site may have contamination problems that cannot be cleaned up by conventional technologies and may require treatability studies. Identifying this need as early in the process as possible allows for the timely start of the treatability program. Treatability testing, using conventional or alternative treatment processes, is intended to reduce cost and performance uncertainties to acceptable levels to allow a remedy to be selected.

(6) Preparation of Project Planning Documents

After the basic direction of the RI/FS has been decided, the actual program planning can begin. The first planning document required for the RI/FS is the RI/FS Work Plan, which details the site background and physical setting, initial data evaluation, work plan rationale, and the RI/FS tasks to be completed. Additional planning documents may include a Project Management Plan, Data Management Plan, Quality Assurance/Quality Control Plan, Health and Safety Plan, and/or Sampling Plan. Other documents may be required, depending on the type of site and the type of work being considered.

Remedial Investigation

The RI portion of the program begins with a field investigation conducted for the purpose of collecting additional data. This data collection activity is designed to answer questions regarding the types of contaminants, the amounts of contaminants, the area contaminated, the spread of the contamination (how fast, what direction, how far), and the risk to human health and the environment.

Samples of appropriate media (e.g., groundwater, surface water, or soil) are obtained for laboratory analysis, and the analytical data are returned to the site for validation. When data validation is complete, the data undergo analysis to yield an understanding of the nature and extent of the contamination.

Other tasks that may be performed concurrently with data analysis include the Baseline Risk Assessment and the identification of chemical- and location-specific ARARs. The Baseline

Risk Assessment conducted during the RI consists of the Environmental Evaluation (EE) and the Human Health Risk Assessment. The purpose of the Baseline Risk Assessment is identification and characterization of the levels and toxicity of the hazardous substances present, the fate and transport of the contaminants, the potential for exposure to the contaminants, and the risk of potential threats to human health and the environment. The Baseline Risk Assessment is used as the basis for determining whether a remedial action is necessary.

After data collection and analysis are completed, treatability studies are conducted. These studies, which can be part of the RI or the FS, determine the technical feasibility of remedial alternatives, and the results of these studies are used in the FS. Treatability studies include laboratory and field tests conducted for the purpose of providing sufficient data to (1) allow evaluation of treatment alternatives during the detailed analysis and (2) support the remedial design of the selected alternative.

For example, in a treatability study involving treatment of contaminated soil by incineration, small amounts of soil are incinerated in a laboratory (bench-scale testing) to determine the efficiency of the operation, the temperatures required, and the amounts of material remaining after incineration. In the field condition test (pilot-scale study), a small-scale version of the equipment in a realistic setting is tested to determine the amount of soil that could be incinerated during a particular time period, the energy requirements for the system, and the process by-products.

If sufficient data are available, treatability studies may be initiated as soon as the RI program starts. The laboratory test portion of the treatability study may require significant time; to ensure timely completion of the RI/FS, laboratory testing can be started before the FS begins. Treatability studies are dependent on the initial data available and on data collected during the RI field investigations for successful completion. Occasionally, additional data are needed for the treatability study; this data need must be determined as early as possible in the process.

Feasibility Study

During the FS, remedial alternatives are developed and screened in the following steps:

1. Identify potential treatment technologies and containment/disposal requirements of residuals or untreated waste

2. Evaluate technologies

3. Identify action-specific ARARs

4. Assemble technologies into alternatives

5. Screen alternatives as necessary

The FS process gradually eliminates unsuitable remedial options from the long list of possible remedies. The initial list of remedial options may include potential alternatives that incorporate emerging technologies as well as those that have been used successfully at other sites. After alternatives are developed and screened, the remaining alternatives are subjected to detailed analysis on the basis of the following nine criteria before they are presented to the regulatory agency:

1. Protection of human health and the environment
2. Compliance with ARARs
3. Long-term effectiveness and permanence
4. Reduction of toxicity, mobility, or volume through treatment
5. Short-term effectiveness
6. Implementability
7. Cost effectiveness
8. State acceptance
9. Community acceptance

If additional contamination is detected during the RI/FS process, or if the RI/FS did not eliminate enough uncertainties about the site, a Phase II RI/FS may be conducted. The Phase II RI/FS is conducted in the same manner as the Phase I RI/FS except that the Phase II RI/FS relies on data generated during the Phase I RI/FS for the scoping process.

The Phase I RI/FS may also be followed by an Interim Remedial Action (IRA), which is a remedy that will immediately address contamination that may pose a near-term threat to human health or the environment. An IRA may be implemented at any time during the RI/FS process and is often implemented concurrently with the continuing RI/FS process.

Remedy Selection and Design/Implementation of Remedial Action

Following detailed analysis of remedial alternatives, the regulatory agency makes the decision as to which remedial alternative to use. This decision is part of the Record of

Decision (ROD), which may also contain other information, conclusions, and requirements for site cleanup.

Remedial design and implementation normally occur after issuance of the ROD; however, where the preferred alternative is obvious, the remedial design phase may begin, with regulatory agency approval, prior to issuance of the ROD.

Design and implementation of the selected remedy consists of (1) remedial design, (2) construction, (3) remedial action, and (4) monitoring. After the remedial alternative has been selected, remedial design may begin. The design process is conducted in a phased approach, allowing input and oversight by regulatory agencies. After the agencies approved the final design, construction takes place. Remedial action consists of the actual treatment of the contaminated media, which may take many years to complete. The site is monitored during and after the remedial action to assure that the spread of contamination has been stopped and that existing contamination is being decreased.

3.2.2 RCRA Corrective Action Process

RCRA, as amended by the Hazardous and Solid Waste Amendments (HSWA), requires corrective action for any release of hazardous waste or hazardous constituents from solid waste management units at hazardous waste treatment, storage, or disposal facilities. The mechanism for achieving the corrective action is the RCRA Corrective Action Process, which parallels the CERCLA RI/FS process. The RCRA Corrective Action Process consists of the following activities (parallel CERCLA steps are in parentheses):

- RCRA Facility Assessment (Scoping)
- RCRA Facility Investigation (Remedial Investigation)
- Corrective Measures Study (Feasibility Study)
- Corrective Action Selection and Corrective Measures Implementation (CMI) (Remedial Design and Construction)

<u>RCRA Facility Assessment</u>

The RCRA Facility Assessment (RFA) is conducted by the regulatory agency for each facility requesting a RCRA permit. Information gained during the RFA may indicate that hazardous waste is contaminating the site, in which case the RFA can lead to an RFI/CMS, Interim Corrective Measure (ICM), or legal penalties. The RFA is similar to the scoping stage of the RI/FS process, where the initial problem is identified and the objectives of the RFI/CMS are defined.

RCRA Facility Investigation

The RCRA Facility Investigation (RFI) is similar to the CERCLA RI and is conducted by the owner/operator under a permit schedule, compliance order, or enforcement order detailing the schedule and specific activities. Characterization of the site includes the type and concentration of hazardous material, where the hazardous material is moving, and how fast it is moving. After the contamination has been characterized, the regulatory agency determines the necessity of performing the CMS. Treatability studies may be performed as part of the RFI, serving the same function as in the CERCLA RI. The RFI also includes a Baseline Risk Assessment; however it is not divided into environmental and human health components. An ICM, similar to a CERCLA IRA, may be conducted at any time during the RFI if it is found that adverse exposure to hazardous materials could occur in the short term.

Corrective Measures Study

Information gathered during the RFI is used during the Corrective Measures Study (CMS), which identifies the type of corrective action needed. As in the CERCLA FS process, treatability studies may be conducted and treatment alternatives are evaluated.

Corrective Measures Implementation

After the CMS has been conducted, the corrective measure is selected by the regulatory agency. This decision is called the Corrective Action Decision (CAD). After the regulatory agency issues the CAD, the Corrective Measures Implementation (CMI) begins. The CMI includes design, construction, operation, monitoring, and maintenance of the corrective measure.

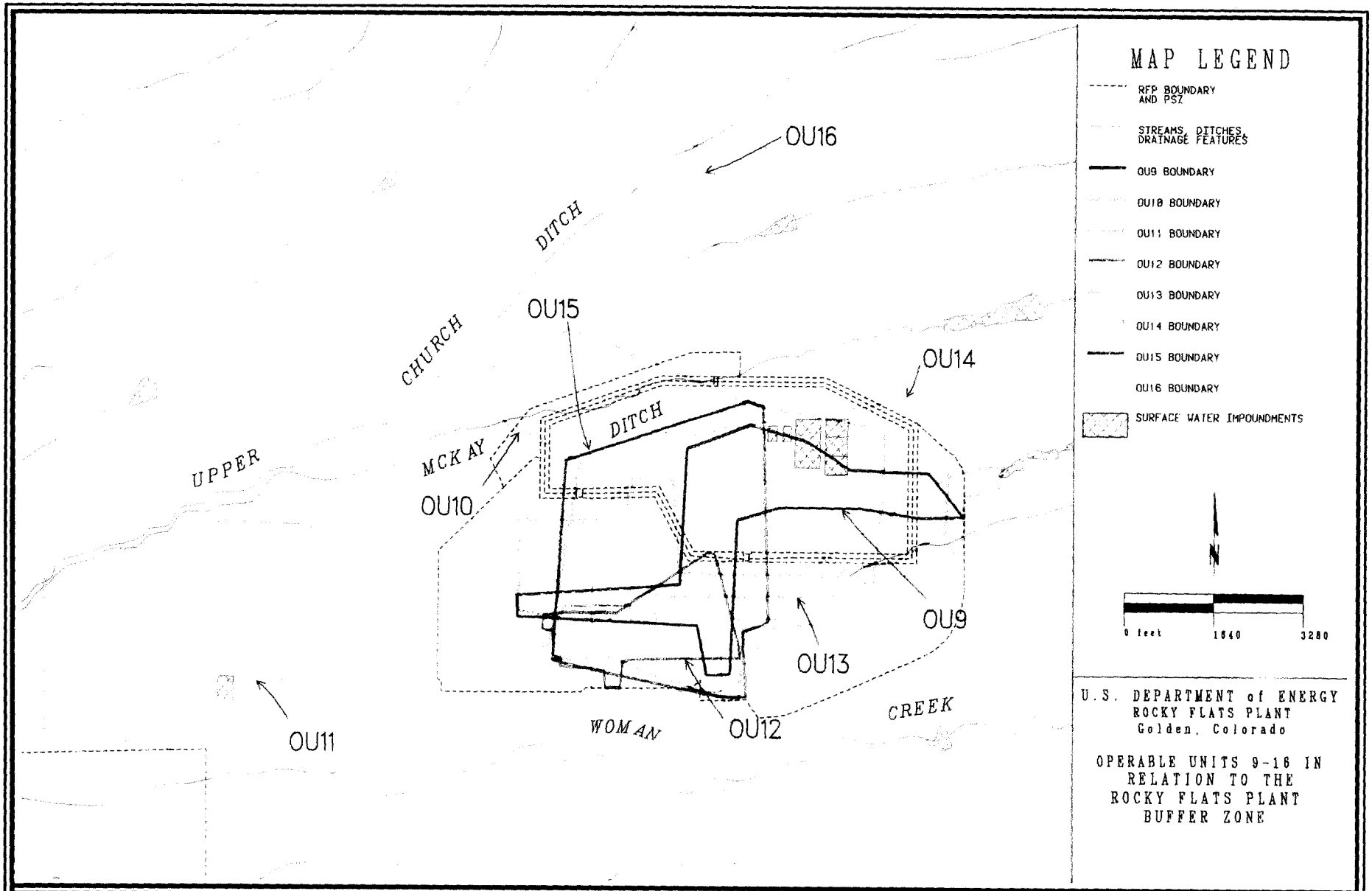
3.3 IMPLEMENTATION OF THE RCRA/CERCLA PROCESS AT ROCKY FLATS

3.3.1 Interagency Agreement (IAG)

In order to establish a common basis of understanding and to integrate the requirements of federal regulators with those of CDH, an Interagency Agreement was negotiated between DOE, EPA, and CDH and signed on January 22, 1991. The purpose of the IAG is to establish a legally enforceable framework to facilitate coordination of cleanup and oversight efforts and to standardize requirements. The IAG establishes specific milestones and time frames for remedial actions as well as penalties for noncompliance with the agreement.

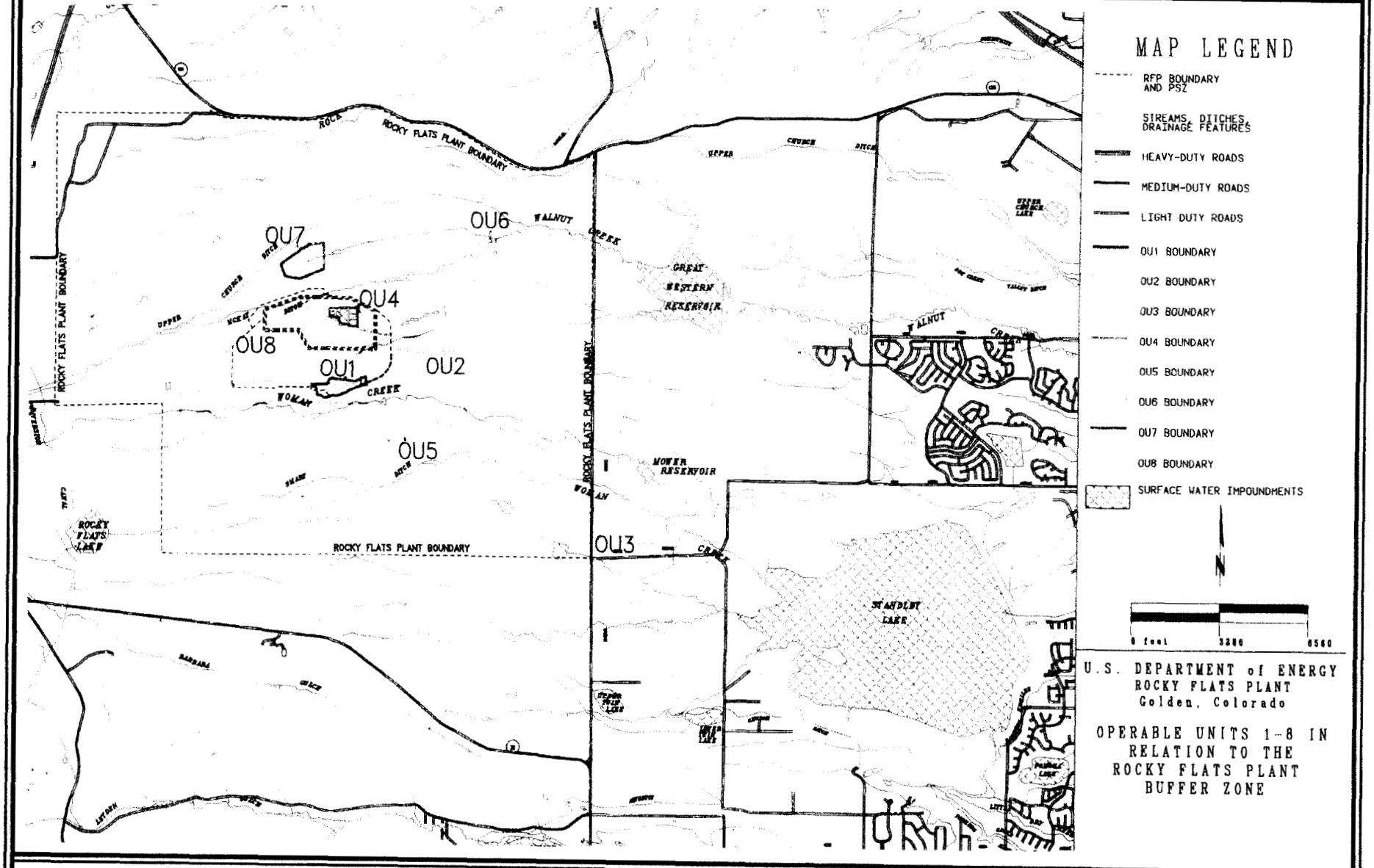
This agreement establishes the parameters for cleanup of potential radioactive, hazardous, and mixed-waste contamination resulting from past operations at Rocky Flats at 178 areas called "Individual Hazardous Substance Sites" (IHSSs). The goal of the Rocky Flats Environmental Restoration Program is to remediate sites so that they can be released as "clean".

Rocky Flats, in consultation with EPA/CDH and in response to public comment, has prioritized the 178 inactive IHSSs, which have been grouped by location and waste type into 16 operable units (see Figures 3.2 and 3.3, and Appendix B). At Rocky Flats, an OU is essentially a geographic area containing IHSSs.



Map of Operable Units 9 - 16

Figure 3.3



Map of Operable Units 1 - 8

Figure 3.2

There are three considerations used when assigning an IHSS to a particular operable unit: (1) geographic location, (2) type of contaminant involved, and (3) relative priority of the IHSS. Given these factors, there is considerable overlap of the OU boundaries (see Figures 3.2. and 3.3).

The priorities for Rocky Flats OUs were established through the IAG. DOE/EG&G technical staff, EPA, and CDH initially prioritized the OUs on the basis of available technical information, but subsequent public comment on the IAG provided input from surrounding communities that resulted in modification of the priorities (e.g., OU 3 - Offsite Areas was given a higher priority).

Assessment, characterization, and remedial activities for individual IHSSs are carried out by OU. The OUs form the basis for planning, scheduling, budgeting, and prioritizing environmental restoration activities. Contamination at the OUs is being assessed, and cleanup activities are being undertaken, with high-risk sites being addressed before lower risk sites.

The designation of OUs into RCRA- or CERCLA-regulated units is based on the effective date of the 1980 RCRA regulations. Sites that were operating at the time that these regulations went into effect required "interim status permits" to continue operation and therefore became RCRA units. At Rocky Flats, the following are interim status units: Solar Ponds, West Spray Field, Present Landfill, Original Process Waste Lines, and other smaller IHSSs grouped into the Other Outside Closures and Inside Building Closures OUs. Sites that were inactive at the time that RCRA regulations went into effect were designated as CERCLA OUs.

Sitewide Activities represent activities that are not OU-specific or activities that support all OUs. These broad-based activities provide work plans that support both the RCRA OUs and the CERCLA OUs; thus, Sitewide Activities are designated as both RCRA and CERCLA units. Sitewide Activities are discussed in section 3.4.4.

RCRA regulations provide for EPA to allow the state to regulate hazardous waste sites. CDH has been granted authority to regulate RCRA sites under the CHWA and is the lead agency for most RCRA sites at Rocky Flats. EPA is the lead agency for the CERCLA OUs.

Table 3-1 below lists OU designations, site grouping, the number of IHSSs, and the regulatory designations of Rocky Flats OUs:

Table 3-1

OU	Site Grouping	No. of IHSS	Regulatory Designation
OU 1*	881 Hillside	11	CERCLA
OU 2*	903 Pad, Mound, and East Trenches	20	CERCLA
OU 3	Offsite Releases	4	CERCLA
OU 4	Solar Ponds	1	RCRA
OU 5	Woman Creek	10	CERCLA
OU 6	Walnut Creek	20	CERCLA
OU 7	Present Landfill	2	RCRA
OU 8*	700 Area	38	CERCLA
OU 9	Original Process Waste Lines	1	RCRA
OU 10	Other Outside Closures	19	RCRA
OU 11	West Spray Field	1	RCRA
OU 12	400/800 Area	12	CERCLA
OU 13	100 Area	15	CERCLA
OU 14	Radioactive Sites	9	CERCLA
OU 15	Inside Building Closures	8	RCRA
OU 16	Low-Priority Sites	7	CERCLA
	Total	178	

* Per the IAG, joint agency oversight has been established.

The IAG framework established the joint EPA, CDH, DOE agreement for designation and administration of RCRA and CERCLA remediation at Rocky Flats. DOE, EPA, and CDH recognized that the two regulatory agencies could potentially impose conflicting requirements on DOE, given the overlap between respective authorities under RCRA or CERCLA.

For purposes of the IAG, EPA and CDH established a joint review of each OU. The "lead" regulatory agency is assigned according to the RCRA or CERCLA designation of that OU. (Note: The IAG established joint lead agency oversight for OUs 1, 2, and 8.) The agency not assigned direct authority serves as the "support" regulatory agency. DOE, EPA, and CDH recognize the need for, and the benefits derived from, joint agency review.

3.3.2 Environmental Restoration Schedules

The IAG sets forth a complex set of interdependent activities that must be performed in a particular sequence, with support from many agencies, organizations, and individuals. Planning and performance of these activities is managed through a detailed work schedule.

This schedule, which consists of a program management network with over 5,000 activities, was developed to define the work and associated milestones to be accomplished under the requirements of the IAG and to establish the budgetary requirements to carry out this effort. The IAG is the implementation document by which Rocky Flats establishes activities to be performed, the interdependencies (logic) of these activities, and the resources required to perform each activity. The IAG schedule is the fundamental basis for the automated project management system utilized by EG&G in performing cleanup activities at the site. This schedule also forms the basis for FYP budget requirements and milestones. Each OU defined by the IAG has an Activity Data Sheet (ADS) (described in Section 1.1) for assessment and an ADS for remediation. Detailed information on the IAG schedule is available in the IAG schedule document, which is available at the information repositories mentioned in Section 1.7.4.

3.3.3 NEPA Integration with CERCLA and RCRA

The National Environmental Policy Act (NEPA) requires that federal facilities consider the impact of their actions on human health and the environment. NEPA requirements are intended to ensure that reasonable alternative courses of action are identified and that the environmental consequences of proposed actions are investigated. NEPA requires that an environmental impact statement (EIS) be prepared for all activities that significantly impact the environment. However, the necessity of preparing an EIS is determined during the environmental assessment (EA). At Rocky Flats, NEPA requirements are met by conducting an EA for OUs that may require a remedial action. As agreed to in the IAG, NEPA EAs at Rocky Flats are conducted in parallel with ongoing work to prevent any impact on the schedule for completion of RI/FSs or RFI/CMSs.

NEPA also includes requirements for documentation of environmental reviews associated with hazardous substance remedial action projects. DOE has issued Notice 5400.4, "Integration of Environmental Compliance Processes" (DOE/Headquarters, 1988), which establishes the policy for meeting the requirements of the NEPA and the CERCLA RI/FS (or RCRA RFI/CMS) processes for activities under CERCLA (or RCRA). This policy is intended to integrate the requirements of NEPA with the planning and environmental review procedures of the CERCLA RI/FS (or RCRA RFI/CMS) process so that all such procedures run concurrently rather than consecutively.

3.3.4 RI/FS and RFI/CMS Activities at Rocky Flats

RI/FS and RFI/CMS processes at Rocky Flats are very similar in that both types of investigations include scoping, fieldwork, and characterization of the nature and extent of contamination. The RI/FS and RFI/CMS processes also are dependent on data generated during sitewide studies. The FS (or CMS), which includes treatability studies and evaluation of remedial alternatives, depends on sitewide treatability studies to expedite the FS. The purpose of the sitewide treatability studies is to evaluate potentially applicable treatment technologies for media at Rocky Flats that are anticipated to require treatment. These treatment technologies will be used as candidate technologies in the OU-specific treatability studies and for the range of alternatives available for the FS (or CMS). Early identification of these candidate technologies results in increased efficiencies and potential cost savings within each operable unit.

Scoping

Scoping studies are initiated approximately two months prior to initiating preparation of an RI/FS (or RFI/CMS) work plan. The primary purpose of scoping is to provide information for preparing the OU site description document, a key element of the RI/FS (or RFI/CMS) work plan. As part of the scoping study, existing data and some non-intrusive field data may be gathered and analyzed for use in the site description document. Data analysis and evaluation are also used in determining whether any interim response actions are required for the OU under investigation. Existing data at Rocky Flats may be found in the Background Geochemical Characterization, Sitewide EIS, RI/FS (or RFI/CMS) reports, sitewide surface water and groundwater monitoring reports, risk assessments, and other project-specific documents.

Work Plans

Work plans for all OUs to be assessed and characterized under the RI/FS (or RFI/CMS) process are prepared by Rocky Flats and are approved by EPA/CDH before fieldwork begins. Work plans contain information describing the OU and details of field activities and sampling plans, analytical requirements, data management and evaluation procedures, and reporting procedures.

Preparation and approval of a typical work plan is currently estimated to take 16 months; in the first 9 months, an initial draft work plan is prepared and submitted for EPA/CDH review. Draft plans are prepared by EG&G and its subcontractors, reviewed by DOE, and revised for submittal to EPA/CDH. After EPA/CDH review, comments are incorporated into a second revision. As the work plan for each OU is being developed, the schedule for the RI/FS or RFI/CMS activities will be revised to reflect any newly identified requirements for that OU.

Remedial Investigation (or RCRA Facility Investigation)

An RI (or RFI), as defined by its work plan, will be conducted for each OU. Investigations will be carried out in one or more phases. The Phase I RI (or RFI) includes (1) radiation surveys, (2) surveying and mapping the OU, and (3) collection and analysis of samples of air, surface soils, groundwater, surface water, and other applicable media. As the data are received and analyzed, they will be incorporated into the Rocky Flats Environmental Data System (RFEDS) for access and use in the analytical phase. Phase I RI (or RFI) data and the results of the data analysis will be reported and used in the Phase I FS (or CMS) to determine the need for additional data and as a basis for the Phase II RI (or RFI) work plan if it is required.

If additional data are needed, a Phase II work plan supplement will be prepared for EPA/CDH review and approval. Phase II investigative activities will be conducted in areas where additional data are needed. At the conclusion of the Phase II RI (or RFI), DOE will prepare a report for EPA/CDH review and approval. Submittal of this report is a milestone for each OU in the IAG.

Feasibility Study (or Corrective Measures Study)

An FS (or CMS), as defined by its work plan, will be conducted as necessary for each OU. In all cases, the study activities will follow the IAG and the CERCLA (or RCRA) guidance published by EPA.

The RI (or RFI) and FS (or CMS) are essentially conducted in parallel, as the FS (or CMS) begins during RI (or RFI) fieldwork activities. The data collected in the RI (or RFI) influence the development of remedial alternatives in the FS (or CMS), which can in turn affect data needs for the treatability studies. The purpose of the Phase I FS (or CMS) is the definition of cleanup objectives and the development and screening of remedial alternatives. The most appropriate remedial alternatives for a site are selected through a comparative analysis of each option, based on effectiveness, implementability, and cost. The selected alternatives will undergo further evaluation during the remedy selection process.

In many cases at Rocky Flats, multiple RI (or RFI) sequences are required. This results in Phase I and Phase II RI (or RFI) sequences occurring for OU (e.g., a Phase I investigation specifically addressing soil contamination and a Phase II investigation addressing surface and groundwater contamination. The Phase II FS (or CMS) builds on the data from the Phase I and Phase II RIs (or RFIs) and continues to serve as the mechanism for development, screening, and detailed analysis of remedial alternatives.

Proposed Plan/Responsiveness Summary

DOE will submit a draft Proposed Plan simultaneously with submittal of the final FS (or CMS) report. The draft Proposed Plan summarizes the alternatives and details the implementation plans for the remedy selected. The IAG mandates a two-month public comment period on the draft Proposed Plan and final FS report to solicit input from the public. At the end of this comment period, the Responsiveness Summary is prepared and submitted for agency review. EPA, CDH, and public comments on the FS (or CMS) report and draft Proposed Plan are addressed in the final Proposed Plan.

Record of Decision/Corrective Action Decision

Upon approval of the Proposed Plan, EPA will prepare and issue a Record of Decision (ROD) (or Corrective Action Decision [CAD]) so that remedial actions for the OU can proceed under CERCLA (or RCRA) requirements. The ROD (or CAD), which is based on the Proposed Plan, documents the remedy selection process, the decision on the proposed project, and the rationale for the decision. Issuance of the ROD (or CAD) is a milestone for each OU in the IAG.

3.4 REMEDIAL ACTIONS AT ROCKY FLATS

Remedial assessments and actions have been initiated for the seven highest priority OUs at Rocky Flats. Brief descriptions of the units funded in FY92 are included in this section. A more detailed description of the remedial assessment process under way at 881 Hillside (OU 1) is included to illustrate the dynamic nature of the remedial process.

3.4.1 Detailed Description of 881 Hillside (OU 1) Remedial Action

The 881 Hillside area was designated as a high-priority site because of the elevated concentrations of volatile organic compounds (VOCs) in groundwater, the relatively permeable soil, and the proximity of the site to a surface water drainage (Woman Creek). A map of the 881 Hillside area is provided in Appendix B.

The 881 Hillside area (OU 1) was designated as a CERCLA Past Practice Unit because most of the contamination at the site resulted from past waste management practices. Scoping for the RI and cleanup of OU 1 included a review of available historical information pertaining to the 881 Hillside area in addition to information generated during several sitewide studies. Eleven individual sites within the 881 Hillside area were identified in two 1986 sitewide studies and the IAG.

The Phase I RI was initiated in March 1987 to determine the exact nature of contamination at the 881 Hillside sites. The RI consisted of preparation of detailed topographic maps, radiometric and organic vapor screening surveys, surface geophysical surveys, a soil-gas survey, a well boring program, soil sampling, and groundwater and surface water sampling. In two of the 11 IHSSs in OU 1, the concentrations of organic chemical contamination warranted concern. Alluvial groundwater in the area immediately south of Building 881 (IHSS 119.1) was found to be contaminated with various VOCs. Contamination was also found in the area of the outfall of the foundation drain for Building 881 (IHSS 107). This information was included in a draft of the RI/FS report submitted to EPA/CDH on July 1, 1987. The identification of VOCs in these IHSSs necessitated additional study, which was carried out in the Phase II RI. Data from additional drilling and the responses to EPA and CDH comments were incorporated into the draft Phase II RI report submitted to CDH and EPA on March 1, 1988.

In the Phase I FS, which was also initiated in 1987, information from the initial RI was incorporated, the need for remedial action was evaluated, and a technical analysis of the possible remedial actions that could be taken to eliminate or contain contamination was performed. The report stated that there was no imminent threat to public health or the environment from contaminants at the 881 Hillside area. However, the travel time for a contaminant to reach the property boundary was estimated to be on the order of 80 years, and the risk assessment included in the study documented that under these conditions, an unacceptable risk could be posed to the public by consumption of contaminated alluvial groundwater. Therefore, the FS was expanded to include selection of an appropriate remedial action. The alternative approaches were screened on the basis of their performance, reliability, ease of implementation, safety, cost, and compliance with federal, state, and local environmental and public health standards. Three possible remedial technologies, in addition to the "no action" alternative, were retained after the screening process and detailed analysis of alternatives.

ARARS were identified for each remedial option. In this case, applicable regulations included those associated with groundwater treatment and subsurface discharge (such as the requirements of the Colorado Clean Water Act), relevant and appropriate requirements under RCRA for storage and treatment of hazardous waste, and the Colorado siting criteria for RCRA hazardous waste disposal sites. The Phase I FS report, which was submitted to EPA and CDH on March 1, 1988, recommended that (1) a French drain be installed hydrologically downstream of IHSS 119.1 and (2) collected groundwater be treated.

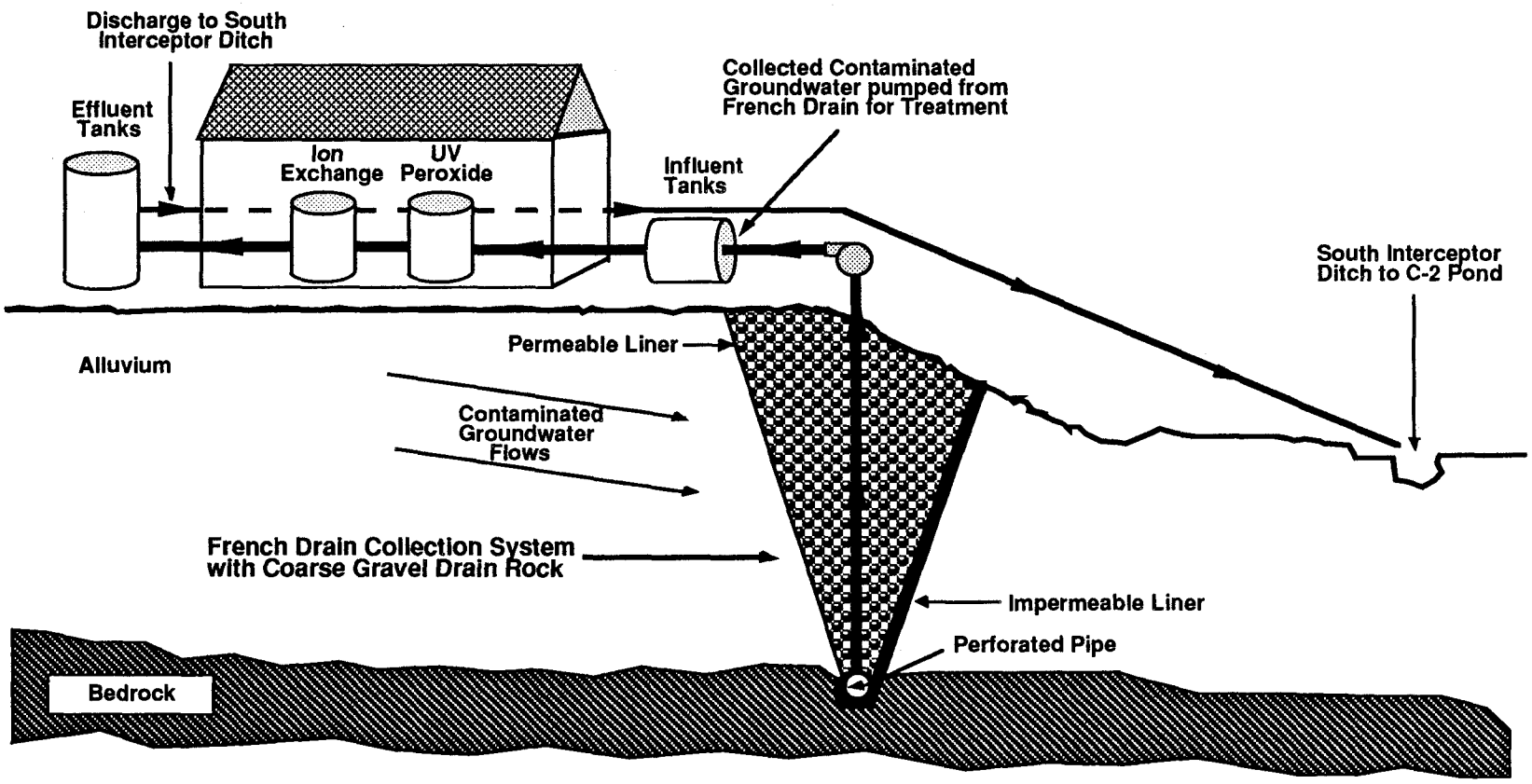
NEPA regulations require that an EIS be prepared to document the possible environmental and public health impacts of any "major federal action significantly affecting the quality of the human environment." Therefore, an EA of the three selected remedial alternatives was prepared to fulfill the NEPA requirements and to aid in final selection of a remedial action. The EA investigated the impacts of the remedial alternatives on air and water quality, animal and plant life, site archeology, short- and long-term land productivity, risks of

exposure to workers and members of the general public during routine operations, and risks due to accidental exposure. The final report was submitted to EPA/CDH on May 5, 1989.

Several decisions resulted from review of the draft Phase I and Phase II RI and FS reports. A Phase III RI cycle was initiated to further verify the data collected in the Phase I and II investigations. The existence of inorganic contamination in either alluvial or bedrock groundwater had not been determined because of a lack of information on the naturally occurring background levels of inorganic compounds in this type of environment. Therefore, plans for the Phase III studies included background monitoring of inorganic compounds to aid in determining whether inorganic contamination exists in the 881 Hillside area. Some of the soil VOC data collected during the Phase I and Phase II investigations were rejected during the data validation stage; collection of new and more extensive soil VOC data was included in the Phase III RI, and a more extensive radiological survey was also undertaken. The Phase III FS Work Plan, submitted in January 1990, included plans for an evaluation of treatment and disposal options for contaminated soil if warranted by the results of the Phase III RI. Treatment alternatives for removal of inorganic contaminants are also being analyzed.

DOE proposed an IRA to minimize the release of hazardous substances from the 881 Hillside area while the selection process for the final remedial action is under way. The IRA will prevent contaminated groundwater from reaching Woman Creek. The IRA Plan proposes (1) a new source well in the vicinity of well 9-74, (2) a new foundation outfall sump at the existing foundation drain for Building 881, and (3) a French drain to be constructed across the base of the 881 Hillside area. Contaminated water collected from these three sources will be pumped to a newly constructed treatment facility for processing and treatment.

The 2,100-foot-long French drain will be constructed and anchored in the bedrock, which underlies the alluvium. This drain will be located downgradient of the contaminated groundwater of the OU 1 IHSSs. An impermeable barrier will be constructed between the bedrock and the surface, with a piping system located on the upstream side to collect contaminated groundwater (see Figure 3.4). Monitoring wells will be installed to assess the effectiveness of the groundwater collection system. Collected water will be pumped to an onsite treatment facility for removal of organic compounds and metals. The treatment facility will destroy organic contaminants using an ultraviolet peroxide oxidation system and will remove metals contamination with an ion-exchange system. The treated water will be released to the South Interceptor Ditch, which drains into pond C-2. Water that collects in pond C-2 will be held for sampling and analysis and will be treated if necessary before transfer to ponds on Walnut Creek. The water in Walnut Creek flows into the Broomfield Diversion Ditch, bypassing Great Western Reservoir.



OU 1 881 Hillside
Interim Remedial Action (IRA)
Figure 3.4

The IRA assessment (including an EA) was completed, and IRA construction began in January 1990. Construction will be complete and the system is scheduled to be operational in the third quarter of FY92.

3.4.2 Operable Unit 2 - 903 Pad, Mound, and East Trenches Areas (ADS #1002A & B)

A program of RI/FS and remedial actions is under way at OU 2. The sites encompass three areas (903 Pad, Mound, and East Trenches areas) located on the eastern side of the site's security area. A total of 20 contamination sites are included in the three investigative areas.

Contamination of the 903 Pad and Mound areas is largely attributed to waste drum storage in the 1950s and 1960s. The waste drums corroded over time, allowing hazardous and radioactive materials to leak into the surrounding soil. Some additional contamination is thought to have resulted from wind dispersion during drum removal and soil movement activities. Rocky Flats studies have established that the 903 Pad contributed to the OU 3 contamination through eolian inputs.

The East Trenches area was used for disposal of plutonium- and uranium-contaminated waste and sanitary sewage sludge from 1954 to 1968. Two areas adjacent to the trenches were used for spray irrigation of sewage treatment plant effluent, some of which may have contained contaminants that were not removed by the treatment system.

Routine groundwater investigations at Rocky Flats to-date indicate the presence of VOCs in the shallow and bedrock groundwater systems in the vicinity of these sites. A portion of the surface water contamination results from seeps, which are areas where groundwater emerges at the surface. Most of the seeps are dry during some portions of the year.

If not collected, water from the seeps eventually flows to either Walnut Creek or Woman Creek and then to a series of retention ponds. Water in the ponds is treated and sampled prior to and during release to ensure compliance with the Rocky Flats National Pollutant Discharge Elimination System (NPDES) permit and other applicable standards.

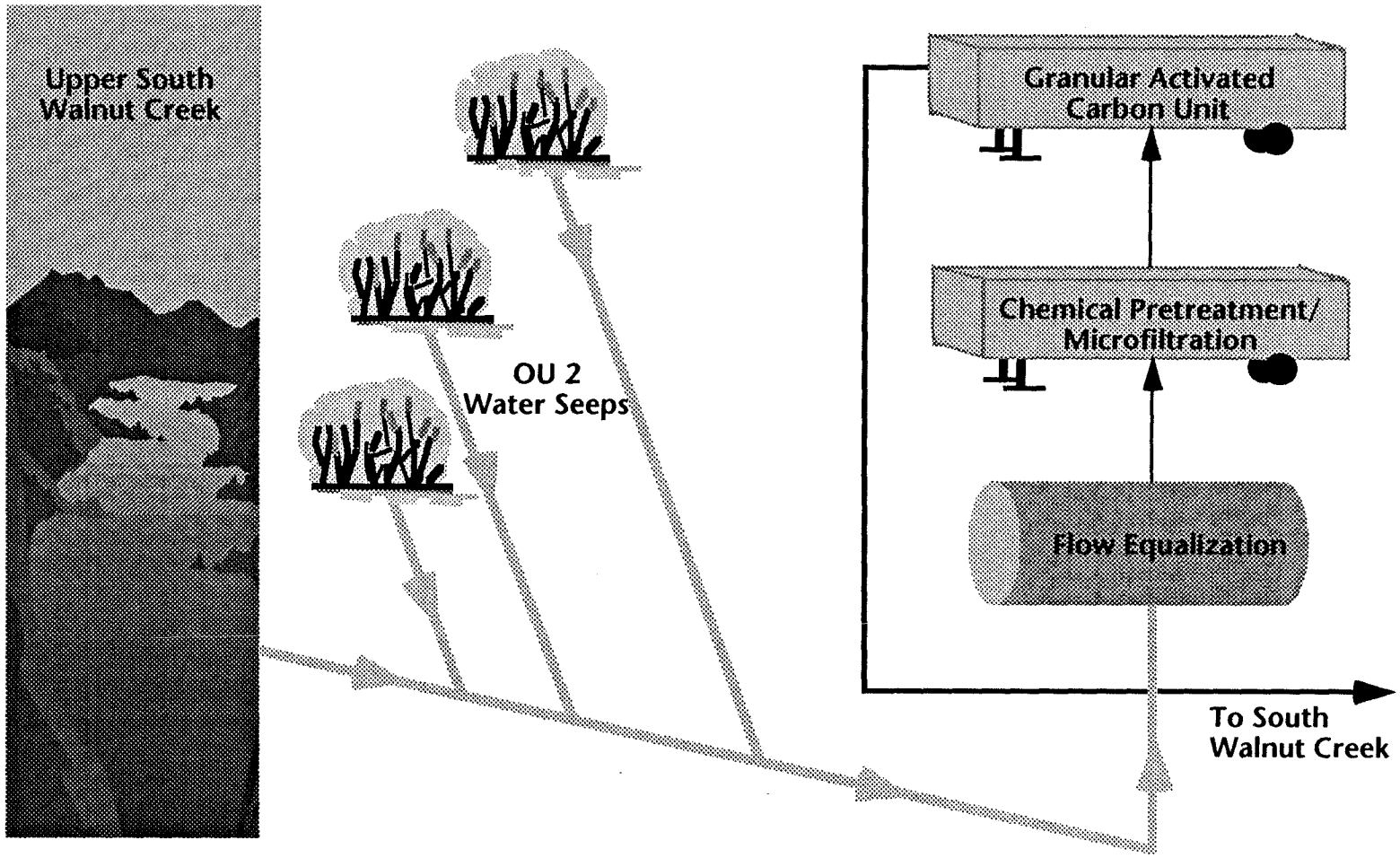
The spray irrigation areas have been designated as IHSSs partially because of the potential for chromium contamination resulting from a plant spill of chromic acid that entered the sanitary sewers on February 23, 1989. Sampling initiated by Rocky Flats on the spray irrigation areas indicated that leachable chromium concentrations in soils are significantly below RCRA limits. Additional contamination may include metals and nitrates.

In March 1987, a Phase I RI under the Environmental Restoration Program (formerly known as the Comprehensive Environmental Assessment and Response Program [CEARP]) began at OU 2. The investigation included preparation of detailed topographic maps, radiometric and organic vapor screening surveys, surface geophysical surveys, a soil-gas survey, a well boring and completion program, soil sampling, and groundwater and surface

water sampling. Phase I field activities were completed at the 903 Pad, Mound, and East Trenches areas during 1987, and a draft RI report was submitted to EPA and CDH on December 31, 1987. Phase I data did not allow adequate characterization of the nature and extent of contamination for the purpose of conducting an FS of remedial alternatives. A Phase II RI sampling plan presenting the details and rationale for further fieldwork, based on results presented in the draft RI report, was submitted in June 1988.

The Phase II RI fieldwork (alluvial) began in the third quarter of FY91. The Phase II RI fieldwork (bedrock) is scheduled to begin in the fourth quarter of FY91. This work includes hydrogeologic studies, detailed source and plume characterization, and surface soil and biota surveys. Field activities and laboratory analyses for both alluvial and bedrock investigations are scheduled for completion in the fourth quarter of FY92. The Baseline Risk Assessment is scheduled to begin in the second quarter of FY92. Preparation of the draft RI report is scheduled to begin in the third quarter of FY92, and the final report is scheduled to be issued in the fourth quarter of FY93. The EA, treatability studies, and NEPA documentation are scheduled for completion by June 1995. Engineering and construction are scheduled for completion by the end of FY98.

Design and development of a final remedy to address all of the contamination at OU 2 will require lengthy technical investigations and assessments. At the request of EPA/CDH, DOE is implementing an IRA to control and treat contaminated surface water in the immediate area of OU 2. The IRA described below was begun in May 1991. The final IRA Decision Document, which was submitted on March 11, 1991, outlines the plan for collection of surface water from South Walnut Creek and seep sources within OU 2. The collected surface water will be treated using granular activated carbon (for organics removal) and a chemical precipitation/filtration system (for radionuclide and metals removal) (see Figure 3.5). The field treatment unit will be located north of the eastern Rocky Flats access road and immediately west of the western boundary of the East Trenches area. After treatment, the effluent will comply with the chemical-specific ARARs before being discharged to South Walnut Creek. Pretreatment to remove suspended solids to the 0.1-micrometer particle size will ensure optimum performance of the other treatment units.



OU2 903 Pad, Mound, and East Trenches
Interim Remedial Action (IRA)
Figure 3.5

The complete analysis of selected IRA treatment technologies is provided in the IRA Plan. The effectiveness of the preferred treatment system will be verified through laboratory and field treatability studies. The early phases of the pilot field treatability tests will intercept water from one contaminated seep that flows into South Walnut Creek and will also withdraw surface water from South Walnut Creek itself. After treatment, the water will be returned to South Walnut Creek above the retention ponds. Hence, immediately upon start-up, the field treatability test unit will provide the added benefit of reducing the contaminant load on South Walnut Creek and the terminal ponds. All construction of collection and treatment equipment is scheduled for completion no later than October 1991. A summary of the treatability study findings will be submitted to EPA/CDH upon completion of the program in early 1992. Bench-scale testing has begun in support of a separate IRA for Woman Creek.

3.4.3 Operable Unit 3 - Offsite Areas (ADS #1011)

A CERCLA RI/FS process is under way at OU 3. This activity involves assessment of plutonium contamination to offsite areas, including the land surface, Great Western Reservoir, Standley Reservoir, and Mower Reservoir.

Accomplishments to date:

- The draft Phase I RI Work Plan was submitted on July 10, 1991.

Upcoming Milestones:

- The final Phase I RI Work Plan will be submitted by December 16, 1991.
- All Phase I fieldwork and laboratory work will be completed by January 1993.
- The RI report will be completed in December 1993.

In addition, a 1985 out-of-court lawsuit settlement, *McKay v. United States,* mandates remediation and revegetation of approximately 350 acres of IHSS 199. This lawsuit settlement required deep plowing of contaminated land to place the plutonium contamination deep beneath the surface. The plowing was initiated and subsequently stopped after it was determined that this was in direct violation of CERCLA/SARA guidance. The RI/FS CERCLA process was instituted at that time.

The priority of remediation of the Offsite Areas has been raised (changed from OU 10 to OU 3), reflecting the public concern voiced during public comment on the IAG.

3.4.4 Sitewide Activities (ADS #1012)

Sitewide activities include development of various plans, procedures, and/or studies that are IAG requirements and impact various environmental restoration tasks that are not included in any one OU. Many of the sitewide programs provide data to the OU-specific RI/FSs and RFI/CMSs. Sitewide background studies, treatability studies, and risk assessments provide initial and supplemental data to the OUs. The Sitewide Health and Safety Plans, Quality Assurance Project Plan, Sampling and Analysis Plan, and Standard Operating Procedures provide information on how to conduct environmental restoration operations at Rocky Flats. Sitewide tasks include the activities described below.

- A sitewide groundwater monitoring program initiated in 1986 includes 258 wells that are sampled and analyzed on a quarterly basis. The program is designed to characterize the groundwater hydrology and quality at the site.

- The background characterization of surface water, groundwater, and soils is being conducted along with assessment of contamination at other OUs at the site. The Background Hydrogeochemical Characterization and Monitoring Plan was submitted to EPA/CDH in January 1989, and implementation of the plan began in September 1989. The background characterization report was completed in the first quarter of FY91. Sampling and analysis will continue for subsequent years, and the background report will be updated annually. This document is designed to provide input on individual OUs for the RI/RFI and FS/CMS processes.

- The IAG and CERCLA require development of a community relations plan describing the mechanism that will be used to address community concerns and foster community involvement. The community relations plan contains information regarding community relations activities, public repositories, mailing lists and newsletters, news releases, public meetings, public notification, records availability, public comment opportunities, public hearing opportunities, and technical assistance grants. The final Community Relations Plan was submitted in January 1991. The Community Relations Plan Responsiveness Summary, a document that provides a catalog of all comments received during the public comment period as well as actions taken in response to comments, was submitted in June 1991.

- The Historical Release Report, which provides a complete listing of all spills and releases of hazardous substances occurring since the inception of Rocky Flats, was started in FY91 and will be completed in June 1992. The Historical Release Report contains a comprehensive listing of all known contamination and is used to support the individual OU/IHSS identification. This information will be used by EPA/CDH to determine whether any additional sites need incorporation into OUs.

- The final Health and Safety Plan, which documents specific health and safety procedures, has been submitted for EPA/CDH review. The procedures outlined in this plan are required to ensure the health and safety of the investigative team and others (including the general public) during RI/FS and RFI/CMS processes, treatability studies, and implementation of the corrective/remedial actions for each OU. Training on these procedures will take place prior to any RI (or RFI) fieldwork.

- The final Plan for the Prevention of Contaminant Dispersion (PPCD) was completed in July 1991. This plan details activities that will be implemented to minimize the potential for windblown dispersion of waste dusts or other harmful materials from any site capable of releasing potentially hazardous windblown materials. A public review and responsiveness summary regarding this plan was also prepared in FY91.

- The Sitewide Treatability Study Plan was finalized in June 1991. This plan identifies technologies that are likely to have broad applicability across Rocky Flats and establishes procedures for actual tests to be performed to better determine the applicability of those technologies. After the sitewide treatability studies (scheduled for completion in FY92) are conducted, a treatability study report will be prepared to provide data that may be substituted for OU-specific treatability studies. For some OUs, however, it will be necessary to perform OU-specific treatability studies to support the FS.

- Rocky Flats is required to develop a work plan for implementing radionuclide discharge limits for water discharged via spray irrigation or stream drainages. The work plan, which will be submitted in August 1991, will require (1) sampling A, B, and C series ponds for radionuclides prior to discharge and (2) treatment of the water if specified contaminant levels are exceeded.

- A draft of the Sampling and Analysis Plan, which includes a Quality Assurance Project Plan (QAPP) and Standard Operating Procedures (SOPs), was submitted for EPA/CDH review. The sitewide Sampling and Analysis Plan (SAP) is designed to serve as the basis for the initial individual OU SAP. Each OU SAP will be modified to its own unique SAP requirements. Comments were incorporated into the final plan, which was completed in the second quarter of FY91. The QAPP describes the policy, organization, functional activities, and QA protocol necessary to achieve DQOs. SOPs detail the specific field techniques to be utilized during investigation of the site as well as provide guidance for performance of all fieldwork. Training as set forth in these plans and procedures will occur prior to commencement of any RI (or RFI) fieldwork. Implementation of the QAPP and SOPs will continue through FY92.

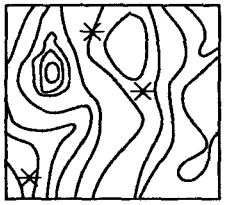
- Sitewide Environmental Assessment (EA) activities were initiated in the second quarter of FY91. Scoping and implementation plan activities for the Sitewide Environmental Impact Statement (SWEIS) were completed in FY91. Work has begun on the SWEIS, which is being prepared to meet the requirements of NEPA. The SWEIS process, which will continue through FY92, involves an assessment of potential sitewide environmental impacts resulting from all environmental restoration activities.

- The Administrative Record, which is a compilation of all documentation required by the IAG, will be updated. The Administrative Record contains public comments and DOE responses to comments as well as annual updates of the Five-Year Plan, the Site-Specific Plan, and other planning documents.

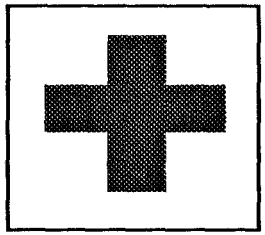
A schematic diagram of the major sitewide accomplishments for FY91 and planned milestones for FY92 is shown in Figure 3.6.

Completed Milestones

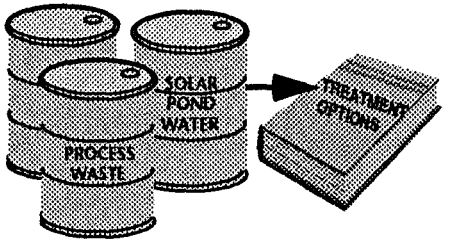
Community Relations Plan



Background Characterization

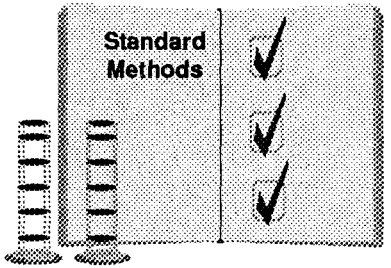


Health & Safety Plan



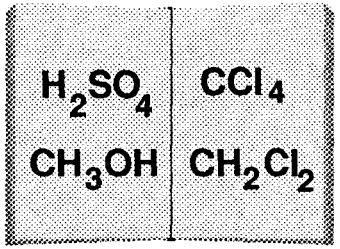
Treatability Study Plan

Plan for Prevention of Contaminant Dispersion

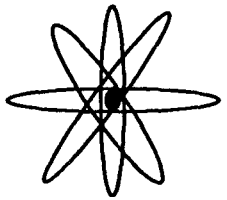


Quality Assurance Project Plan

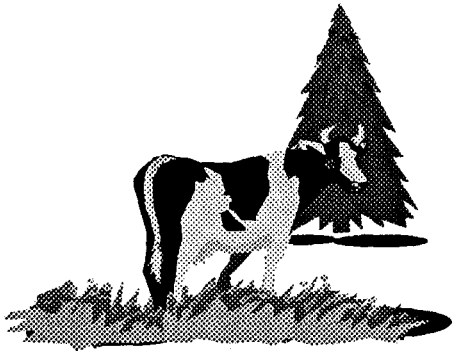
FY92 Milestones



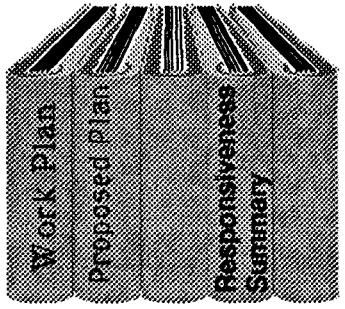
Historical Release Report



Discharge Limits for Radionuclides



Environmental Impact Statement



Administrative Record

Sitewide Activities

Figure 3.6

3.4.5 Operable Unit 4 - Solar Evaporation Ponds (RCRA Closure) (ADS #1258A & B)

Solar Evaporation Ponds

The Solar Evaporation Ponds consist of a series of five evaporation ponds located in the central portion of the site. Pond 207-A was placed into service in August 1956; ponds 207-B, North, Center, and South were placed into service in June 1960; and pond 207-C was placed into service in 1970. These ponds were formerly used for storage and treatment of liquid process wastes and other waste types. Placement of process waste material into these ponds ceased in 1986 as a result of changes in Rocky Flats waste treatment operations.

Interceptor trenches were installed downgradient from the ponds during the period from October 1971 to April 1974 to prevent natural seepage and pond leakage from entering North Walnut Creek. In April 1981, this system was replaced by the current interceptor trench drain system. Site studies in the area indicate that groundwater flows northeastward from the ponds area toward the North Walnut Creek drainage. The interceptor system was constructed to capture groundwater flowing from the ponds area prior to reaching North Walnut Creek. The interceptor system has been very effective in collection of groundwater in the alluvium.

The Solar Evaporation Ponds are RCRA interim status regulated units that are currently inactive. Leakage from the ponds has contaminated soils and groundwater with volatile organics, heavy metals, and radioactive material. A closure plan submitted to the regulatory agencies on July 1, 1988, called for in-place closure of contaminated liners and subsoils. A proposal was submitted to the regulatory agencies in February 1989 to modify the closure plan for removal of contaminated liners and subsoils to achieve residual contaminant concentrations protective of human health. Closure activities include dewatering the impoundments; removing, solidifying, and disposing the pond sludges and sediments at the Nevada Test Site; and collection and treatment of contaminated groundwater. Contaminated groundwater will also be collected and treated to achieve compliance with 40 CFR 264.92, "Groundwater Protection Standards," at the point of compliance.

The CDH AIP has significantly accelerated activities for pondcrete disposal. Concurrent with closure activities are investigations to characterize the extent of subsurface soil and groundwater contamination and the conduct of a risk assessment to determine the need to remove liner material and soil to achieve risk-based acceptable residual contaminant concentrations.

DOE's proposed cleanup action involves an initial partial closure of the ponds in order to eliminate the flow of harmful contaminants into groundwater and soil. The method of action calls for evaporation of the pond water (approximately 12 million gallons) and sludge removal. Sludge removed from the ponds and solidified with Portland cement (referred to as "pondcrete") will be transported to the Nevada Test Site.

The methods used to complete partial closure of the solar ponds include pond dewatering and sludge removal. The ponds will be dewatered by natural evaporation, enhanced natural evaporation, and forced evaporation. Enhanced evaporation will be achieved by (1) adding a nontoxic dye to the water to promote increased solar heat absorption and (2) utilizing heater/soaker pipes, which increase the surface area for evaporation. Forced evaporation will be achieved by utilizing an existing evaporation system and portable evaporator units. The forced evaporation method will be used for water collected by the French drain system and residual water produced by precipitation. Concentrate from the evaporator processes will be solidified for disposal at the Nevada Test Site. Sludge from the ponds will be removed and mixed with cement to solidify into pondcrete blocks for shipment to the Nevada Test Site.

After sludges and sediments have been removed from the pond areas, temporary measures will be employed to prevent erosion of the sidewalls and additional leaching of contaminants through the soil. The measures consist of forced evaporation of collected precipitation. This system will be in place until final closure activities are under way. Construction of temporary storage tanks to hold trench water from the interceptor system will be completed by October 1991.

The ICM decision process, including the draft ICM treatability report and DOE and public review and comment periods, is scheduled to begin in the first quarter of FY94 and be completed by the third quarter of FY95. Engineering design will be completed in FY96, and construction will be completed in FY98.

The draft Phase I RFI Work Plan was submitted for EPA/CDH review in July 1991. The RFI Work Plan review and final preparations for fieldwork will continue.

Solar Evaporation Pond Clean-Out: Pondcrete

Pondcrete produced by solidifying pond sludge with cement will be transported in containers approved by the U.S. Department of Transportation (DOT) to the Nevada Test Site for disposal. The waste will meet Nevada Test Site waste acceptance criteria, which prohibit the presence of free liquids and fine particles. To ensure that pondcrete meets low-level mixed waste acceptance criteria, the waste will be sampled before shipment and tested to certify compliance. Solidification and stabilization with cement is the Best Demonstrated Available Technology for this type of waste. More than 6,000 boxes of pondcrete have already been shipped to the Nevada Test Site.

All of the pond water will be removed, treated, and reused in the plant raw water systems to the extent possible. Runoff and groundwater collected in the french drain system will be held for treatment; some of the current stock of unacceptable pondcrete will be reprocessed, and analytical laboratory capability will be in place by the end of FY91.

The pond sludge will be removed and solidified in FY92 for shipment to the Nevada Test Site in FY93. In addition, all of the remaining unacceptable pondcrete will be reprocessed and repackaged in FY92 for shipment to the Nevada Test Site in FY93.

The process of removing the sludge may have a temporary impact on air quality. Excavation of sludge and sediments could result in releases of volatiles to the atmosphere; however, effects are considered negligible, based on data contained in the 1988 Annual RCRA Monitoring Report for Regulated Units at Rocky Flats. Release of particulates to the atmosphere will be controlled through dust suppression techniques and will be monitored through ambient air monitoring to ensure that adequate control measures are being implemented. Additional air emissions will result from the portable evaporator process and associated power sources. The evaporator process will be designed to preclude carry-over of radioactive particulate contaminants, but evaporator tank vents will be equipped with high-efficiency particulate air (HEPA) filters. As a further precaution, air monitoring will be performed during unit operation. The portable evaporators will be powered by natural gas for a cleaner emission source.

The potential for human health impacts will arise from the possibility of worker ingestion or inhalation of resuspended materials during sludge and sediment removal operations. To alleviate this problem, sludge will be collected while the material is a slurry. Sludge solidification activities will be conducted in an enclosed area with filtered ventilation discharge. Personal protective measures and equipment that meet applicable standards and OSHA requirements will be employed.

Additional risks specifically associated with shipment of solidified waste to a disposal site will be minimal because of the relatively low concentrations of contaminants, the solid form of the waste, and compliance with disposal site waste acceptance criteria and DOT packaging and transportation requirements. Human health effects normally incident to transportation include those resulting from vehicular emissions and possible traumatic injuries and fatalities resulting from vehicular operations.

4.0 DEFENSE PROGRAMS FUNDED (BASE) ENVIRONMENTAL PROGRAMS

Base environmental programs at Rocky Flats provide the ongoing environmental monitoring, modeling, and management support necessary to maintain plantwide compliance with applicable laws, regulations, and agreements. A primary objective of environmental management at Rocky Flats is to minimize and, where practicable, eliminate discharge of radioactive and nonradioactive hazardous effluents. Progress toward this goal is routinely measured by the air, soil, groundwater, and surface water monitoring programs. In the following sections, these programs, the environmental reporting system, and the plantwide chemical control system, all of which are funded by base environmental programs, are discussed.

4.1 AIR PROGRAMS

Air programs at Rocky Flats have been established to monitor the quality of air onsite, near the site, and in surrounding communities. These programs include monitoring of effluent and ambient air as well as various support activities such as meteorological monitoring, air modeling, environmental reporting, and Clean Air Act compliance and permitting.

4.1.1 Air Monitoring Activities

Air monitoring programs have been designed to quantify potential impacts of Rocky Flats' operations on the public and the environment. The various air monitoring activities being performed at Rocky Flats are discussed below.

Continuous Emissions Monitoring (ADS #5003)

Following submittal of Air Pollution Emission Notices (APENs) by Rocky Flats in FY91 (see Section 2.2.3), the Colorado Department of Health (CDH) will evaluate the air emissions sources for compliance with permitting requirements. During the CDH evaluation process, emissions sources requiring continuous monitoring will be identified and monitoring parameters will be established. Beginning in FY92, Rocky Flats will procure and install continuous emissions monitoring (CEM) equipment designed to collect nonradiological gaseous emissions data to comply with the permit specifications. Rocky Flats' exhaust systems will be evaluated, and instrumentation technology applicable to these systems will be reviewed to determine whether existing buildings and exhaust systems must be modified before the CEM equipment can be installed.

Production buildings emitting the highest levels of nonradiological pollutants are likely to be permitted first by CDH, and based on the requirements and the priorities of the permits, CEM equipment will be installed. After the CEM system has been installed and tested, an initial set of data will be collected and submitted to CDH for approval. After CDH

approval, operation, calibration, data analysis, and quality assurance, as required by the permits, will be initiated as ongoing activities.

Effluent Air Monitoring (Radioactive and Nonradioactive) (ADS #5007)

Effluent air monitoring is conducted at Rocky Flats in accordance with NESHAP requirements, which establish emissions standards for substances designated as hazardous air pollutants. The hazardous air pollutants of concern at Rocky Flats include asbestos, beryllium, and radionuclides. Effluent air monitoring for radioactivity is conducted to measure total long-lived alpha activity, uranium, americium, beryllium, and plutonium in airborne particulates. Occasional sampling of volatile organic compounds (VOCs) may also be performed at the request of CDH, as provided in the Colorado Air Quality Control Regulations. Routine monitoring, maintenance, and analysis will continue to be conducted during FY92.

Nonradiological Ambient Air Monitoring (ADS #5008)

Rocky Flats conducts limited monitoring of ambient air to evaluate the nonradioactive parameters of suspended particulates. These pollutants are monitored near the east entrance (Gate 10) using methods approved by EPA. The new National Ambient Air Quality Standards (NAAQS) for particulates (promulgated on July 1, 1987) changed the monitoring of nonradiological particulates in ambient air from the measurement of total suspended particulates to the measurement of particulates that are 10 microns (one millionth of 1 meter) in diameter or smaller (PM10 method). This method provides a more accurate measurement of the harmful effects of particulates because particulates less than 10 microns in diameter cannot be filtered out of the respiratory system by the mucous membranes. CDH has requested that state industrial sources continue sampling for total suspended particulates as well as initiate PM10 sampling until such time that the state incorporates federal PM10 requirements into state regulations. Samplers for total suspended particulates and PM10 samplers at Rocky Flats are collocated to maintain continuity of historical nonradioactive ambient data collected at the site. Routine monitoring, maintenance, and analysis will continue during FY92.

Radioactive Ambient Air Monitoring (ADS #5017)

Radioactive ambient air samplers monitor airborne radioactive materials in and around Rocky Flats. Data obtained from existing samplers are used to quantify the radioactive dose to the public community as a result of Rocky Flats operations. The samplers operate continuously, and the filters are collected periodically for analysis of plutonium-239 and -240. A full network analysis of americium-241 and uranium will be implemented in FY92. Increased importance will be placed on this system as site remedial activities progress.

The Radioactive Ambient Air Monitoring Program (RAAMP) involves installing and operating air sampling equipment that meets PM10 requirements (see previous section) to monitor ambient air onsite, along the site perimeter, and in surrounding communities. A RAAMP Siting Study and the development of a RAAMP sampler prototype will be completed by the end of July 1991. Verification of the siting study and testing and validation of the prototype RAAMP sampler are planned for FY92, followed by procurement and installation of new samplers.

Air Program Upgrades (ADS #5016)

This task includes projects and programs that support air quality monitoring efforts or those that require special study before implementation as routine programs. Some of the activities covered by this task are responses to DOE Tiger Team Audit findings, Governor's Scientific Advisory Panel on Monitoring Systems recommendations, National Oversight Panel (Ahearne and Conway Committees) recommendations, and Rocky Flats Environmental Monitoring Council recommendations. These activities also meet requirements outlined in the Agreement in Principle.

The DOE Tiger Team Audit finding initiative to develop a program for periodic inspection of stack effluent sampling probes has been completed.

Upgrades to the Radioiodine Monitoring (Criticality) Network will be completed by the end of FY92. This monitoring network is intended to provide for a post-release emergency radiological assessment in the event of a reportable catastrophic release. NEPA review of the Radioiodine Monitoring (Criticality) Network to verify that installation of monitoring equipment will not adversely impact the environment will be initiated by the end of FY91.

NEPA review for the community air monitoring stations will be conducted during FY92.

4.1.2 Air Programs Support Activities

Air Programs support includes activities necessary to maintain compliance with air-related regulatory requirements and to enhance the monitoring being performed and the use of the resulting data.

Meteorological Monitoring (ADS #5005)

DOE Draft Order 5400.3 and DOE guidance document "Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance," (formerly DOE Draft Order 5400.xy) require that each DOE facility establish a meteorological monitoring program. Measurements must be taken at locations and heights that will provide a characterization of the atmospheric conditions into which emissions may be released and transported. Under 40 CFR 61 Subpart H, the use of representative meteorological data

from the AIRDOS-EPA computer model for modeling airborne emissions from Rocky Flats Plant is required. The activities supported by ADS #5005 are required to enhance and upgrade meteorological monitoring capabilities in support of emergency preparedness, planning, and operations at Rocky Flats. Meteorological equipment and professional services are needed to meet these requirements.

Meteorological data are currently collected on a continuous basis from a 61-meter tower located west of Rocky Flats. A 10-meter tower, collocated with the 61-meter tower, has been installed and is operational. Installation of monitoring equipment on elevators in existing towers to allow maintenance access from the ground was completed in FY91. A new contract to provide calibration, audits, and minor maintenance of the two towers will be awarded in FY92.

The meteorological monitoring network will be upgraded in order to adequately characterize plant conditions and to support the environmental and emergency response programs. A new network of meteorological stations is being installed across the plant site. The network will provide data to characterize meteorological conditions unique to the site's terrain. Wind velocity measurements that support emergency response and the emergency preparedness plan will be the primary emphasis of the network.

A meteorological workstation will provide data required for forecasting services that will support emergency preparedness, emergency response, and general Rocky Flats functions. The workstation will also provide continuous monitoring of meteorological stations to reduce equipment down-time and maintenance delays and to respond to meteorological upset conditions. The forecasting workstation capital equipment will be procured and operational in FY92.

Air Modeling (ADS #5011)

Air modeling is conducted at Rocky Flats to provide assessment of air monitoring programs and to assist in monitor siting studies. A NEPA-required design-based wind study to predict the contaminant plume migration for a worst-case event scenario has been completed. A monitor siting study to determine the "point of maximum impact" for the location of RAAMP samplers has been designed (see Section 4.1.1). Ongoing FY92 activities include validation of historical contaminant data, use of the AIRDOS-EPA model, and routine modeling in support of NEPA, environmental restoration, and plant activities. Procurement and evaluation of various computerized modeling programs, including other approved EPA and CDH models and various unapproved models, are planned for FY92.

Clean Air Act Implementation/Compliance (ADS #5014)

Rocky Flats will develop technical information and perform field verifications that will be used to demonstrate compliance with air emissions standards. Work under this task includes health physics evaluations of ambient air monitoring data to determine health impacts of

plant operations, research of sampling and analysis techniques and procedures, quality assurance performance audits, HEPA filter and dust resuspension studies, and trend analysis of surveillance data.

In FY91, various field investigations to demonstrate compliance with emission standards were initiated, and the HEPA filter and dust resuspension studies were completed. Negotiations with EPA Region VIII to establish a NESHAP compliance agreement for radioactive stack effluents are continuing, and procedural changes will be made to the Rocky Flats effluent sampling program in FY92. Health physics evaluations will continue through FY97.

Air Permitting (ADS #5027)

Under the Clean Air Act, EPA regulations, and/or State of Colorado requirements, various processes at Rocky Flats require permits. The air permitting process involves preparing and applying for routine air permits, acquiring CDH/EPA approvals for sampling methodology, performing field compliance audits, obtaining NESHAP permits, and preparing and maintaining State of Colorado air quality permits based on CDH's review and evaluation of the site's APENs. An evaluation of VOC source control technologies and a VOC dispersion modeling study will be completed in FY91. Permitting activities will be ongoing through FY92.

4.2 WATER MANAGEMENT PROGRAM

The water management program at Rocky Flats includes activities that address the management and monitoring of surface water and groundwater. These activities are discussed in the following sections.

4.2.1 Surface Water Management

The quality of surface water at Rocky Flats has been a cause of great concern to local communities, DOE/EG&G, federal and state regulatory agencies, and the public because two major water supplies, Great Western Reservoir and Standley Lake, are located directly downstream of Rocky Flats. This concern has resulted in a complex network of regulations, agreements, and procedures for water quality treatment and management at Rocky Flats. The regulatory requirements relating to surface water, Rocky Flats surface water operations, the Surface Water Management Plan (SWMP), and surface water management studies are discussed below.

4.2.1.1 Regulatory Requirements Related to Surface Water

Four sets of regulatory requirements affect surface water management at Rocky Flats: (1) primary laws that require treatment and monitoring of surface water; (2) secondary laws, regulations, and orders that implement primary laws; (3) agreements between DOE and regulatory agencies; and (4) collateral laws that affect surface water.

The primary laws that govern surface water management at the site are the Atomic Energy Act, the Department of Energy Organization Act, and the Clean Water Act. These acts are implemented through regulations, orders, requirements for field operations and contractors, and the National Pollutant Discharge Elimination System (NPDES).

Secondary regulatory requirements that pertain to surface water management are DOE Executive Orders and federal and Colorado laws and regulations. DOE Executive Orders establish environmental programs to assure that DOE operations comply with laws and standards to protect the public from exposure to radiation. A Presidential Order requires DOE to comply with the Clean Water Act and the Atomic Energy Act; the Colorado Water Quality Control Commission has promulgated surface water and groundwater standards for Rocky Flats and waters immediately downstream.

Three agreements affect the management of surface water at Rocky Flats: (1) the Agreement in Principle (AIP) between DOE and CDH, (2) the NPDES Federal Facility Compliance Agreement between DOE and EPA, and (3) the Interagency Agreement (IAG) between DOE, EPA, and the State of Colorado. These agreements require DOE assurance that discharges are in compliance with the Clean Water Act and that contaminated sites are cleaned up.

Collateral laws relevant to Rocky Flats water management operators include CERCLA, RCRA, NEPA, the Anti-Deficiency Act, the Clean Air Act, the Colorado Radiation Control Act, and Colorado water rights laws. These various laws govern DOE's/EG&G's actions in cases of contamination cleanup, hazardous substance management, environmental impact evaluations, spending authorization, air quality projection, radioactive materials management, and water appropriation and use, respectively.

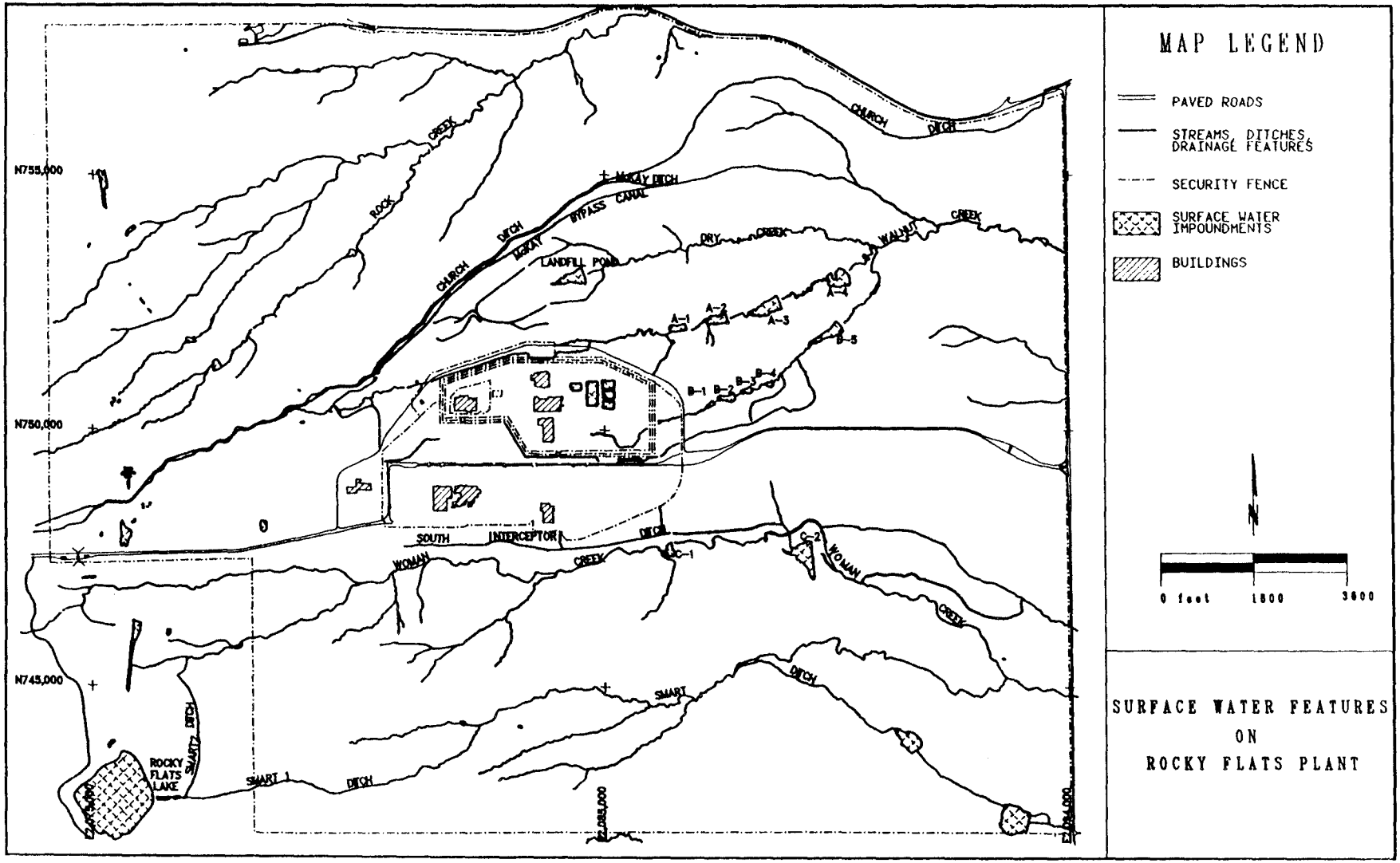
4.2.1.2 Surface Water Operations

Up to 1.5 million gallons per day of treated raw water is delivered to Rocky Flats by the Denver Water Board. This water is used for drinking, showers, laundry, cooling towers, process make-up water, and fighting fires at the site.

All wastewater from processing activities is treated through a special system for process wastewater, which is isolated from other treatment systems at the plant. This treated water is then reused for process make-up and does not discharge offsite. Therefore, process

wastewater is not addressed by surface water management or other base environmental programs.

All sanitary wastewater is treated at the Sewage Treatment Plant, which is located in the South Walnut Creek basin. The Sewage Treatment Plant includes an activated sludge plant and tertiary clarification and filtration facilities. Discharge from this facility is to pond B-3 in the South Walnut Creek basin (see Figure 4.1).



Surface Water Features on Rocky Flats Plant

Figure 4.1

Surface water on the Rocky Flats site consists of base flow in streams and ditches, storm water runoff, treated sanitary sewage treatment plant effluent, and groundwater return flow. Surface water on plant site is managed primarily through three series of detention ponds: the A-series ponds along North Walnut Creek, the B-series ponds along South Walnut Creek, and the C-series ponds along Woman Creek. The combined storage capacity of these ponds is approximately 330 acre-feet.

The ponds serve three main purposes for surface water management: (1) spill control, (2) surface water control for monitoring and possible treatment, and (3) storm water detention. For these purposes, the ponds were designed to retain no more than 10 percent of their volumes for prolonged periods. This assures adequate contingency capacity for spill and flood control. Excess water in terminal ponds B-5 and C-2 will be piped to pond A-4 for storage. If pond A-4 reaches capacity and discharge is needed, discharge is conducted in a controlled manner only after execution of a detailed procedure involving downstream cities, CDH, and EG&G. This procedure includes pre-discharge water quality evaluation to ensure regulatory compliance, water treatment and re-evaluation of the water quality (if required), and written approval from CDH to discharge.

To provide additional control, the City of Broomfield has used DOE funding to construct a diversion ditch around Great Western Reservoir. The ditch is located downstream of pond A-4 and east of Indiana Street and intercepts pond A-4 discharges and routes them to Walnut Creek below the reservoir. Discharges from pond C-2 are also currently routed to the Broomfield Diversion Ditch.

A contingency/emergency release plan has been developed for the ponds, specifying measures and procedures to be taken at Rocky Flats in the event of a severe flood. In addition, other activities are under way to improve surface water operations, including dam reinforcement and water quality characterization and assurance, which are discussed below.

Dam Reinforcement at Ponds A-4, B-5, and C-2 (ADS #5120)

Past surface water management practice has been to maintain terminal pond levels at 10 percent of capacity for relatively short periods of time and to discharge surplus water to Walnut Creek and Woman Creek. Allegations stemming from the 1989 FBI investigation and concerns related to potential water contamination led to adoption of more stringent stream standards by the Colorado Water Quality Control Commission in March 1990. The implementation of these standards through the AIP, which calls for an evaluation of the safety of water discharged from Rocky Flats, resulted in longer water retention times (to allow for sampling, analysis, assessment, and treatment as required) and volumes significantly higher than the 10 percent design capacities for the ponds.

The existing earthen dams were designed as short-term, low-volume water detention structures. If large volumes of water are stored in the ponds for extended periods of time, the dams could eventually become saturated and weaken. Because of the possibility that

these dams will be used to retain higher volumes of water for longer periods of time than originally designed, a dam reinforcement project has been initiated. Appropriate corrective actions will be recommended in the U.S. Army Corps of Engineers study to be completed by the end of FY91. NEPA documentation and design of dam reinforcements for ponds A-4, B-5, and C-2 will take place in FY92, pending recommendations by the Army Corps.

Water Quality Characterization and Assurance (ADS #5121)

New Colorado Water Quality Control Commission (WQCC) standards are in effect for water releases from the terminal ponds, and treatment may be required to assure that discharges of water continually meet these standards. However, effective treatment requires knowledge of water quality variables and their impacts on treatment processes. This activity provides for characterization of contaminants and contaminant sources and refinement of technologies for treatment of the identified contaminants with the goal of optimizing performance against water quality standards. This activity will ensure that changing water quality standards will continue to be met.

Present plans call for shipment of water samples to Los Alamos National Laboratory for contaminant characterization. Assessment of the pond water quality will be completed by the end of June 1993.

4.2.1.3 Surface Water Management Plan

DOE/EG&G has developed the Rocky Flats Surface Water Management Plan (SWMP) to integrate water quality management activities and to address regulatory requirements and public concerns in an effective, unified manner.

The SWMP has four distinct objectives:

1. To create an organizational framework that will facilitate water quality planning with involvement from local cities, the public, and regulators

2. To outline surface water treatment, operations, and management at Rocky Flats

3. To provide a complete description of current and planned surface water management activities at the plant, including the long-range selected management option

4. To assure that surface water management is conducted in compliance with all pertinent laws and regulations

Activities included in the SWMP are described below and in Sections 4.2.1.4 and 4.2.2.

The Long-Term Surface Water Management Plan, which is part of the SWMP, was formulated to identify potential alternatives for long-term management and disposal of surface water at Rocky Flats. These alternatives were identified by DOE/EG&G and the Skaggs Committee, which was formed at the request of Congressman David Skaggs (2nd U.S. Congressional District). The Committee includes representatives from local cities, Jefferson County, DOE, CDH, EG&G, EPA, and the offices of the Governor, U.S. Senator Timothy Wirth, and former U.S. Senator William Armstrong.

The Committee selected an alternative (referred to as "Option B Plus J" or "Option B with Selected Onsite Improvements") for long-term management and disposal of surface water. The major components included in the option are (1) onsite improvements to reduce the volume of surface water discharged from Rocky Flats, (2) offsite improvements to Standley Lake, and (3) utilization of Great Western Reservoir for storm water management of Rocky Flats water and purchase of an equivalent replacement supply for the City of Broomfield. Offsite activities include a replacement water supply for Broomfield and construction of a bypass diversion around Standley Lake. Onsite activities include construction of a new 100-year storm storage reservoir on Woman Creek, pond C-2 interceptor ditch extension, Kinnear Ditch upgrade, and various water treatment, recycling, and improvement projects for surface water management.

The scope and design of the components of the selected alternative will be further developed through continued negotiations involving Broomfield, Westminster, DOE/EG&G, regulatory agencies, and other pertinent parties.

In addition to the components of the above-mentioned option, DOE/EG&G will proceed with other important onsite projects, including drainage system improvements, monitoring programs, and other pond improvements.

4.2.1.4 Surface Water Management Studies

Three types of studies relating to surface water management are under way or planned at Rocky Flats: (1) hydrologic studies, (2) water quality studies, and (3) waste treatment studies. These studies are being conducted to yield a better understanding of water quality and hydrology at the site, which will contribute to improved treatment and management of surface water.

Hydrologic studies include studies relating to site drainage improvements, evaluation of the feasibility of achieving zero discharge from the plant site, development of a site water balance model, evaluation and upgrading of onsite dams, development of hydrologic pond models, and an assessment of long-term water management scenarios for the plant site.

Water quality studies include those related to cleanup activities required under the IAG, an investigation of water issues related to the proposed west expansion office project at Rocky Flats, a source control study to identify potential sources of contaminants onsite, surface water contaminant modeling, detailed radionuclide studies to better understand the characteristics of radionuclides in surface waters at the plant site, and a storm water quality study for the November 1991 NPDES permit application for storm water.

Waste treatment studies that are either planned or under way include a study of the feasibility of reusing Sewage Treatment Plant effluent at the plant site, an investigation of the appropriateness of spray irrigation for wastewater disposal, studies to identify potential future treatment methods for surface water, and a waste minimization program plan. The objective of these studies is to reduce the amount and sources of contaminants in surface waters at the plant site.

4.2.2 Water Monitoring Programs

Extensive water quality monitoring programs have been initiated at Rocky Flats, including monitoring of surface water, groundwater, and public water supplies from surrounding communities. Water monitoring and control enhancements are also being implemented to support these monitoring programs.

Surface Water Monitoring and Program Upgrades (ADS #5019)

These activities include routine collection and analysis of onsite and offsite surface water samples in support of various Rocky Flats program requirements such as the IAG and the NPDES permit. Also covered are efforts to upgrade and enhance the effectiveness and the technical/analytical capabilities of the five surface water monitoring programs.

The routine surface water monitoring program includes monthly sampling of approximately 100 sites to monitor VOCs, radiological parameters, total metals, and inorganics. The program evaluates the impacts of IHSSs (see Section 3.3) on the quality of water leaving the plant site. The NPDES/FFCA program includes sampling required by the NPDES permit and the NPDES/FFCA; routine sampling of detention ponds; onsite sampling with CDH; sampling after spills; sampling to support construction, repair, and evaluation; and sampling of local offsite waters.

An event-based program has been put in place to monitor the potential for radioactive and hazardous chemicals to be transported offsite in runoff from storms. The event-based program involves measuring flow, suspended sediments, and bedload at 13 stations on plant site and in the buffer zone during storm and runoff events.

Lakes and streams in Colorado that are not influenced by Rocky Flats are sampled in the offsite sampling program to provide a baseline water quality assessment for Rocky Flats and

to provide technical justification for Rocky Flats' positions in water quality standards hearings and permit negotiations. In addition, approximately 30 sediment stations throughout the plant site are sampled on a quarterly basis to monitor changes in sediment chemical concentrations over time and to determine the effects of sediment chemistry on surface water chemistry. Routine sampling, data analysis, equipment purchases and upgrades, and reporting will continue through FY97.

Groundwater Monitoring (ADS #5023)

Groundwater monitoring for radionuclides and other parameters has been conducted at Rocky Flats since 1960. Changes in the scope of monitoring activities have occurred in recent years as environmental regulations have been modified and expanded. These changes have intensified characterization and assessment of groundwater through installation of additional monitoring wells, an expanded analytical program, and improvements in quality assurance. The groundwater network now consists of 346 monitoring wells. A draft groundwater protection and monitoring program plan has been developed and was submitted for public comment in June 1991. The plan will be finalized by the end of FY91. Objectives of this program are to:

- Assess impacts to groundwater from past and current operations at the Rocky Flats Plant
- Ensure compliance with federal, state, and local regulations
- Identify trends in groundwater quality
- Implement groundwater protection and management strategies

Groundwater samples are collected and analyzed and water levels in wells are measured on a quarterly basis. The groundwater level measurements are used to assess groundwater flow directions. Forty additional piezometers (pressure meters) were installed within the 384-acre main facilities area to aid in characterizing groundwater flow. At present, approximately 20,000 data items are collected on a quarterly basis from the groundwater monitoring network at Rocky Flats.

NEPA documentation for abandonment of wells that are no longer useful will be completed by the end of FY91. Well abandonment and replacement will take place in FY92.

Community Water Monitoring

Community water monitoring includes sampling and analysis of public water supplies and tap water from several surrounding communities. In the past, Great Western Reservoir, one of the water supply sources for the City of Broomfield, and Standley Lake Reservoir, a water supply for the cities of Westminster, Thornton, Federal Heights, and Northglenn,

received runoff from Rocky Flats drainage systems. Currently, no discharge from terminal ponds A-4, B-5, or C-2 enters either Great Western Reservoir or Standley Lake. Discharged water is routed via the Broomfield Diversion Ditch around Great Western Reservoir and back into Walnut Creek downstream of Great Western Reservoir. In addition to past water runoff, Standley Lake and Great Western Reservoir may have received radionuclide contaminants from airborne sources as a result of various environmental events that have occurred at Rocky Flats. These contaminants, as well as resuspended dust from plant site, may have been washed into these two water supplies. (Contamination in these and other offsite areas is being investigated under ER's OU 3 - Offsite Releases; see Section 3.2.4.3.) Weekly grab samples are collected from Standley Lake and Great Western Reservoir, composited into a monthly sample, and analyzed for plutonium, uranium, and americium concentrations. Tritium and nitrate analyses are conducted on weekly samples.

Samples of drinking water from Boulder, Broomfield, and Westminster are collected weekly, composited monthly, and analyzed for plutonium, uranium, and americium. Analyses for tritium are also performed weekly. Tap water samples are collected on a quarterly basis from the communities of Arvada, Denver, Golden, Lafayette, Louisville, and Thornton. These samples are analyzed for plutonium, uranium, americium, and tritium.

Water Monitoring and Control Enhancements (ADS #5004)

This activity is required under the Clean Water Act, as modified by the AIP, and implements an improved notice of water control system upsets, reducing the chances of NPDES violations. The activity includes (1) implementing monitoring and control enhancements at the ponds and the Sewage Treatment Plant, (2) monitoring dam integrity at the terminal ponds, (3) evaluating and tracking pond and surface water biota, and (4) evaluating the nature and sources of pond contaminants and water quality prior to discharge.

Remote monitoring equipment has been installed on Walnut Creek and Indiana Street. A flow measuring device was installed at pond C-1, and additional piezometers will be installed at terminal dams to measure dam integrity. Additional remote sensing and monitoring equipment will be installed, and biomonitoring of algae and other surface water biota will continue through FY92. Contaminant pathways are being studied, and pond and surface water data are being tracked and evaluated.

4.3 SOIL MONITORING

A number of soil monitoring activities (ADS #5002) are taking place at Rocky Flats to address issues associated with contaminated soils at and near the site. Soil sampling has been conducted annually from 1972 at 1- and 2-mile radii from the plant center in order to examine dispersion patterns and long-term contamination trends. Historically, only plutonium data have been collected and analyzed, but an effort is under way to collect data on other radionuclides for comparison with offsite data. These data have been routinely reported in the Site Annual Environmental Report.

Ongoing soil monitoring projects include (1) comparison and evaluation of existing soil sampling protocols to better understand contamination patterns, (2) calculation of plutonium and americium concentration ratios for the Rocky Flats site, (3) completion of a historical plutonium concentration map and soil sampling and surveys for development of new maps, (4) sampling of soil pore waters in conjunction with bulk soil samples to characterize contaminant transport from contaminated soils into the unsaturated and saturated zones, (5) chemical analysis of soils to characterize sites prior to construction activities, and (6) sampling of non-routine materials to support special projects.

4.4 ENVIRONMENTAL REPORTING

In order to comply with regulatory requirements, various environmental reports under Environmental Reporting (ADS #5013) must be issued on a regular basis. Environmental surveillance and regulatory compliance data are evaluated and reported in the Site Annual Environmental Report, which is published by the EG&G Environmental Management directorate. The 1990 Site Annual Environmental Report was prepared and reviewed in FY91.

Other regulatory reports completed in FY91 include SARA Title III reports, the Environmental Information System/Onsite Discharge Information System Summary, and DOE quarterly compliance reports. Monthly data reports are generated for the routine monthly data exchange meetings with CDH. Data are also prepared for special presentations to DOE and Rocky Flats management as well as for public information.

Quality assurance/quality control (QA/QC) procedures for ambient air sampling will be initiated by the end of FY91.

The Dose Reconstruction and Toxicological Review (Chemical Risk) program was initiated in January 1991 and will be completed in December 1994. The dose reconstruction study will determine the levels of and potential avenues by which hazardous substances (both radioactive and chemical) could have been or may be released from the plant boundaries in order to develop a quantitative health risk assessment for Rocky Flats and the surrounding area. The toxicological review will provide a basic level of knowledge about the variety of hazardous substances that have been used at Rocky Flats and to which surrounding residents may have been exposed.

In early FY92, the Air Quality Management Plan, the Environmental Monitoring Plan, and the 1991 Site Annual Environmental Report will be completed. Also in FY92, annual and monthly environmental reports will be published and the Environmental Protection Implementation Plan will be updated. The dose assessment section of the Sitewide Environmental Report and the Air Quality Management Plan will also be reviewed and updated. Various regulatory reports, including the Pollution Prevention Awareness Plan annual update and the DOE Quarterly Compliance Report, will be prepared. Groundwater, surface water, and air quality management plans will be revised.

4.5 CHEMICAL CONTROL SYSTEM

The Chemical Control System, a comprehensive electronic system for managing the storage and use of hazardous materials, is under development and is expected to be implemented by the end of FY91. Implementation of this system will ensure the site's compliance with state and federal regulations pertaining to hazardous materials. The four principal functions that will be accomplished by the Chemical Control System are as follows:

1. The system will produce electronic Material Safety Data Sheets (MSDSs) that are in a standard format and standard terminology and are accessible plantwide via the Rocky Flats Local Area Network.

2. A real-time chemical inventory will be maintained, allowing on-line updates, bar-code labeling, application of warning labels, inventory reporting, and processing of physical inventories. Baseline data entry into this portion of the system has been completed.

3. A real-time chemical tracking system that will track hazardous chemicals from purchase requisition to final offsite disposal will be made available.

4. The system will provide reports, including inventory reports, chemical usage reports, and reports required by SARA Title III, Section 312 (Tier II) and SARA Title III, Section 313, Form R.

5.0 WASTE MANAGEMENT

5.1 OVERVIEW

This section provides a discussion of FY92 Waste Management activities as well as ongoing activities at Rocky Flats. Waste Management activities are categorized according to their function: (1) regulatory compliance and project administration (referred to as "Continuity of Operations"), (2) waste minimization, (3) waste treatment, (4) waste storage, and (5) waste disposal.

Within each category of Waste Management activity, various wastes are handled according to waste type. The six waste types generated at Rocky Flats are categorized according to their level of radioactivity and the presence/absence of RCRA-regulated hazardous components. Applicable permitting, treatment, storage, and disposal requirements are determined according to these waste types.

This section also includes descriptions of specific waste streams. The specific procedures for handling each waste stream are developed according to applicable regulations.

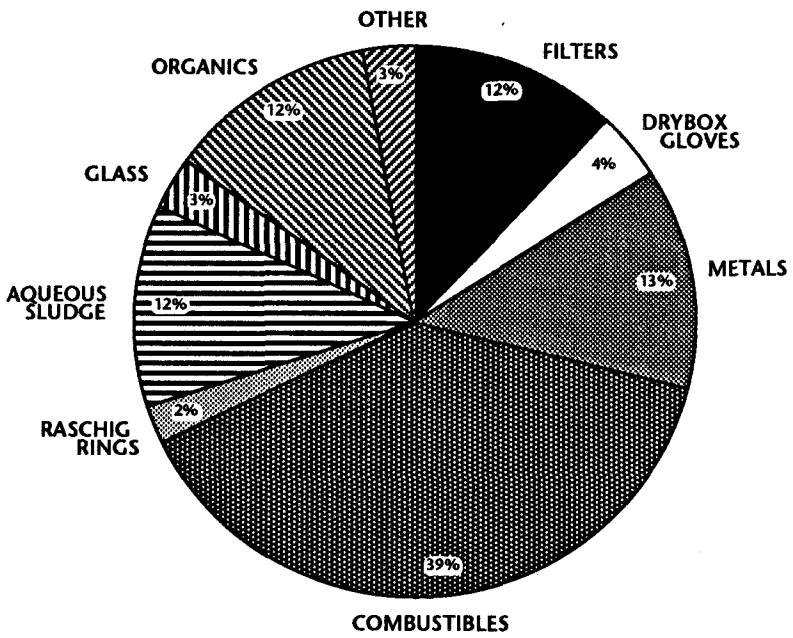
Waste Types

Six major categories of waste are generated at the site: transuranic (TRU) waste, low-level waste, hazardous waste, mixed waste, residues, and sanitary waste. Brief descriptions of these waste categories are as follows:

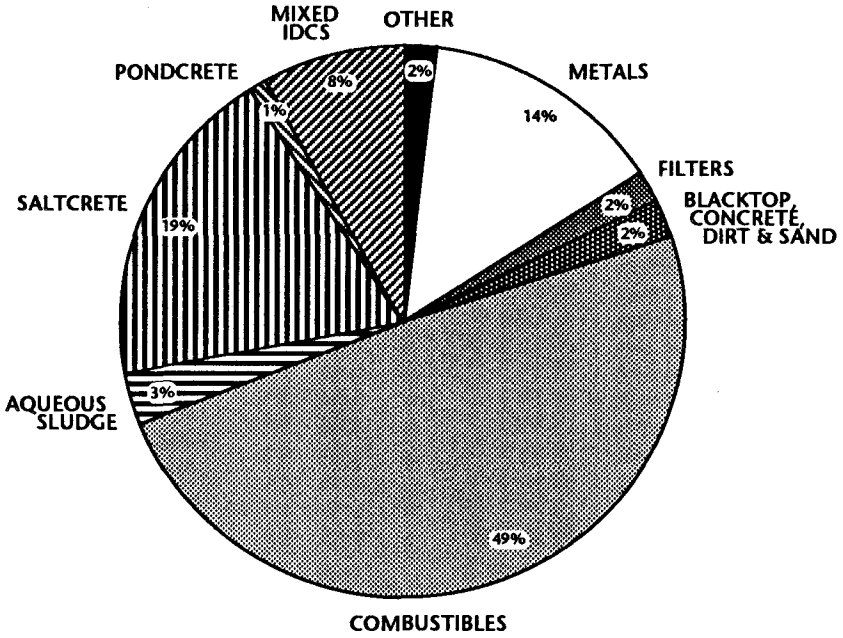
Transuranic waste is contaminated with alpha-emitting radionuclides (atomic number greater than 92) with half-lives greater than 20 years and in concentrations of 100 nanocuries (nCi) per gram (g) or greater. At Rocky Flats, TRU waste is primarily contaminated with plutonium and americium. This waste is usually classified as contact-handled waste because the package surface dose rate is no greater than 200 millirem (mrem) per hour, no additional shielding of the waste is required, and the waste can be handled directly by waste operations personnel using standard protective equipment. Remote-handled waste has a surface dose rate greater than 200 mrem per hour; Rocky Flats does not generate remote-handled waste. A distribution of the components comprising FY90 TRU and TRU-mixed waste is shown in Figure 5.1.

Low-level waste is radioactive waste that is not classified as high-level radioactive waste, TRU waste, spent nuclear fuel, or uranium or thorium tailings. The concentration of radionuclides in low-level waste is less than 100 nCi/g. A distribution of the components comprising FY90 low-level and low-level mixed waste is shown in Figure 5.1.

TRU/TRU-MIXED



LOW-LEVEL/LOW-LEVEL MIXED



This data reflects a shut-down condition.

Rocky Flats Plant
1990 Generated Waste Distribution

Figure 5.1

Hazardous wastes are materials defined as hazardous because they are listed in state or federal regulations or exhibit hazardous characteristics as defined in state or federal regulations. Hazardous characteristics include reactivity, corrosivity, ignitability, and toxicity. In this document, the term "hazardous waste" refers to wastes that are not radioactively contaminated (see definition of mixed waste).

Mixed waste contains both radioactive and hazardous waste constituents. This type of waste is either TRU-mixed waste or low-level mixed waste and must be managed in accordance with both appropriate radioactive waste regulations and hazardous waste regulations.

Residues are process by-products that contain radioactive materials in concentrations greater than the economic discard limit and that are recycled to recover the radioactive materials. Some residues contain hazardous waste constituents and are undergoing characterization to support ongoing compliance activities. Defense Programs is responsible for the management of residues.

Sanitary wastes include general refuse and solid wastes that are not contaminated with either radioactive or hazardous material. Sanitary wastes are disposed in an onsite landfill or treated by standard sewage treatment methods.

5.2 CONTINUITY OF OPERATIONS (COO)

Activities included in this section represent the daily project/program operations involved in Waste Management and related projects. These activities are primarily plantwide in nature, providing support in the areas of general management, data management, compliance activities, and technical and engineering operations.

5.2.1 Ongoing Program Support

EG&G Waste Programs is responsible for providing planning, budgeting, engineering, and technical support to the following: Liquid Waste Treatment Operations, Solid Waste Treatment Operations, Waste Assay and Shipping Operations, Regulated Waste Operations, and Waste Repacking and Solidification Operations. Waste Programs activities (ADS #3177) include:

- Developing and maintaining adequate waste processing capabilities for the entire plant and updating, tracking, and writing procedures to assure that these capabilities are maintained in a proper and safe manner

- Implementing waste management operating procedures, including appropriate operator training and qualification

- Providing program planning support to all ER&WM organizations, waste tracking and storage reporting data to state and DOE agencies, and support for the FYP, SSP, and other planning documents required by DOE

- Providing program/project management and control of waste management engineering projects

- Providing cost, schedule, and performance tracking for waste management organizations

- Developing, implementing, and maintaining waste quality assurance programs

The following activities are planned for FY92: (1) implementation of the master planning/ tracking system; (2) development of the computerized capital budgeting system; (3) update of annual planning documents, including the SSP, Roadmap, and FYP; and (4) support of low-level waste shipments to the Nevada Test Site.

5.2.2 Compliance Activities

Permitting and compliance activities at Rocky Flats provide the framework necessary for waste generators at Rocky Flats to comply with all applicable federal, state, and local waste laws, regulations, and orders (ADS #81). Specifically, these activities include RCRA permitting, hazardous substance release response and reporting, inspection of waste management operations, and training.

In FY91, work was done on several RCRA permit and permit modification applications, including the Building 374 Evaporator Permit modification for treatment of Environmental Restoration program liquid waste and the Centralized Waste Storage Facility permit modification. The group also conducted more than 1,000 inspections of waste management activities.

In FY92, ongoing RCRA permitting, surveillance, and guidance activities will continue. In addition, the following permit actions are planned: low-level mixed waste storage building permit modification, preparation of a revised TRU-mixed waste Part B permit application, response to the Notice of Deficiency (NOD) or Notice of Completion (NOC) for a TRU-mixed Part B permit application, the Buildings 374 and 774 upgrade permit modification, the incinerator permit modification, and the process waste transfer system upgrade permit modification.

As required by the Residue Compliance Agreement of November 1989, all stored and newly generated mixed residues must be brought into compliance with RCRA regulations. FY91 efforts focused on identification and description of residue storage locations and preparation of compliance schedules, inspection schedules, closure plans, and a waste analysis plan. Part

A and Part B RCRA permit applications and additional closure plans will be completed in FY92.

5.2.3 Waste Stream Characterization (ADSs #5055, #5061, and #5292)

The Waste Stream and Residue Identification and Characterization (WSRIC) Program was designed to meet the need for current waste characterization at Rocky Flats. It updates the initial Waste Stream Identification and Characterization (WSIC) Program conducted in 1986 and 1987. The current characterization effort, which is driven by RCRA and fulfills agreements between DOE, EPA, and CDH, addresses residues (which were not included in the initial WSIC).

The primary objective of the WSRIC Program is to provide complete and accurate characterization of all onsite waste streams in sufficient detail to enable compliance with all applicable regulations and to effectively manage and minimize wastes and residues.

The WSRIC Program Draft Report, completed for all of the major process areas in September 1990, consists of individual building reports that describe in detail the waste streams generated from processes conducted in those buildings. Characterization is both quantitative (using analytical techniques) and qualitative (using process knowledge). The process outputs of 101 buildings have been evaluated, with a total of 498 processes generating 4,004 identified output streams. Building books were updated in FY91, and books will be prepared for the 165 remaining buildings by mid-FY92.

Most of the characterizations completed to date have used process knowledge. In FY92, sampling and analytical capabilities will be improved, thus enhancing future characterizations. Analysis of more than 1,000 samples is planned for FY92. Other FY92 activities include:

- Preparation of a residue characterization plan
- Characterization of any new waste streams
- Characterization of residue streams using process knowledge
- Transfer of data to the Waste and Environmental Data Management System (see below)
- Development of waste stream characterization data bases

5.2.4 Waste and Environmental Data Management System

The Waste and Environmental Data Management System (WEMS) project group (ADS #90) is developing computer hardware and software capability for plantwide tracking of waste products. When complete, the system will perform the following functions:

- Provide official records required by RCRA
- Track waste packages from generation through assay, storage, and shipping
- Provide required record keeping and automated load management for offsite transportation

The waste inventory tracking and control and the offsite shipping portions of the project have been completed. Waste stream characterization data were loaded into the system's data base in FY91. The liquid waste tracking and generator portions will be initiated in FY92.

5.3 MINIMIZATION

The Rocky Flats Waste Minimization Program was formally organized in 1988 and has aggressively pursued techniques to reduce the volume and toxicity of Rocky Flats waste streams. The program is conducted to achieve cost reductions and support sound environmental practices as well as to meet EPA and CDH requirements for waste minimization and requirements of DOE Orders. The program focuses on the top two tiers of the environmental protection hierarchy: waste reduction at the source and environmentally sound recycling. The primary objectives of the program are to reduce the volume and toxicity of all generated wastes and to recycle, recover, and reuse waste material whenever possible.

Two goals support these objectives: (1) raise employee awareness of the need to prevent pollution, instilling a desire to minimize waste at all organizational levels and (2) develop, adapt, and implement new and existing waste minimization/pollution prevention technology as rapidly as possible.

Waste minimization programs have been in effect for several years and have become more important under RCRA and the resulting FFCA for LDR. Plantwide efforts over the past few years have been successful. For example, TRU waste generation was reduced from 4,328 cubic yards in FY84 to 2,269 cubic yards in FY88 and to 1,341 cubic yards in FY89. In some cases, this TRU waste, through better segregation and assay techniques, was categorized as low-level waste. Low-level waste minimization projects will further reduce this waste form. Hazardous solvent use in uranium and non-nuclear manufacturing and maintenance areas has been reduced by more than 90 percent from 1986 to the present.

Employee involvement is key to minimizing wastes in specific work areas through process improvement and reduced usage of hazardous materials. The direct experience and process knowledge held by those working in a specific area will make possible the achievement of Rocky Flats' minimization goals.

Future targeted reductions are numerous and include elimination of the use of hazardous solvents in plutonium manufacturing processes, improved segregation of TRU waste from low-level waste to reduce the volume of TRU waste generated, material substitutions for hazardous substances, process changes, and equipment redesign. Projects identified to achieve future reductions are categorized under the seven ADSs discussed below. A more comprehensive description and a prioritization of these projects are provided in the Waste Minimization Assessment Report and the FY91 Waste Minimization Program Work Plan. The seven ADS programs, along with key projects, are summarized below.

5.3.1 Program Administration (ADS #3242)

The Program Administration work category covers the administrative needs of the Waste Minimization Program and includes the following waste minimization related activities: (1) planning new work and exercising management control over ongoing work, (2) providing education and motivation for employees and increasing public relations efforts, (3) preparing studies and analyses necessary to justify and prioritize work, (4) demonstrating the success of the program, and (5) reporting to DOE, federal and state regulatory agencies, and the general public. All of these activities are funded with the program's operating expense budget.

FY91 accomplishments by Waste Minimization Program Administration include:

- Preparation of the waste minimization portion of the DOE FY93-97 Five-Year Plan
- Preparation of Base Programs ADSs
- Preparation of the FY91 Waste Minimization Program Work Plan
- Launch of a major training and awareness initiative, which gives employees practical waste minimization techniques and guidelines to apply in their own work environments
- Initiation of the first phase of the Process Waste Assessment project, a facility-wide process flow and material balance to better define and prioritize waste generation problems
- Completion of a computerized data management system with baseline waste generator data
- Preparation of the Rocky Flats Plant Annual Waste Reduction Report

- Initiation of the waste minimization and pollution prevention awareness program plan

5.3.2 TRU/TRU-Mixed Waste and Residue (ADS #5030)

Several opportunities have been identified for minimization of TRU and TRU-mixed waste and residue materials. These projects are briefly described as follows:

- Replacement of raschig-ring tanks, which require waste-producing maintenance as a function of their design, with geometrically favorable tanks, which require a lower level of maintenance and do not generate waste materials as a result of maintenance activities. (This is an ongoing project.)

- Installation of vacuum cleaners in Building 707 gloveboxes to reduce or eliminate the use of solvents for cleaning and to reduce the time required for cleaning.

- Installation of pre-filtering devices in gloveboxes, which will increase the life of high-efficiency particulate air (HEPA) filters located downstream of the prefilters.

- Installation of hydrocyclones in process lines, which will significantly reduce the amount of particulates reaching the in-line Fulflo filters. The hydrocyclones will extend the life of the Fulflo filters and thereby reduce the volume of filter waste being generated; feasibility testing was carried out in FY91, and the decision to proceed will be made in early FY92.

- Evaluation of the feasibility of recycling existing lead-bearing mixed waste and of manufacturing lead articles (such as glovebox shielding) in a way that facilitates decontamination and reuse.

- Installation of a recirculating system for machine coolant oil to replace the existing continuous flow-through system.

- Development and fabrication of a regenerable and longer lasting in-line liquid filter to replace the polypropylene-wound Fulflo filters currently in use.

5.3.3 Low-Level/Low-Level Mixed Waste (ADS #5031)

Low-level and low-level mixed wastes are frequently generated in cleaning processes at Rocky Flats. The following projects are intended to reduce the quantity of those waste forms:

- Installation of a mobile decontamination unit that uses a hot water spray followed by vacuum pick-up for cleaning areas with radioactive contamination, eliminating the use of large quantities of wet paper towels and cloths. "Cold" testing was carried out in FY91.

- Installation of a carbon dioxide pellet blasting unit to strip and decontaminate metal material or equipment, thereby reducing the use of solvents, improving operational efficiency, and increasing the portion of material that can be recycled. A demonstration was performed in FY91, and the decision to proceed will be made in early FY92.

- Installation of a centrifugal washer and dryer for recycling uranium chips, replacing the current "chip roasting" method, which results in disposal rather than recycle of the uranium chips. Design of the system and procurement of the unit, which is commercially available, were initiated in FY91. Installation in Building 447 will be completed in FY92.

5.3.4 Hazardous Waste (ADS #5032)

Two projects have been identified for minimizing hazardous wastes:

- Installation of a drum washer/crusher to clean drums after they have been emptied of hazardous materials and ready them for reuse or to crush them prior to disposal.

- Installation of an aqueous, ultrasonic cleaning system (nonhazardous) to replace the trichloroethane dip tanks currently used in the maintenance shop and the Building 444 heat treatment operation. The maintenance shop installation is complete.

5.3.5 Process Wastewater (ADS #5033)

Large volumes of process wastewater are used at Rocky Flats and require subsequent treatment in the Building 374 evaporator. Treatment is costly (approximately $0.50 per gallon). The following activities are in progress to recycle wastewater and reduce overall usage of water:

- Installation of a system that recycles the third-cycle laundry rinse water for use as first-cycle laundry wash water, thereby reducing the currently large volumes of wastewater that require treatment in Building 374.

- Installation of water treatment units for recycle of process wastewater from film processing operations in five buildings. The Building 460 installation was completed in FY91.

- Rerouting and recycling of overflow from the deaerators, which supply water to the Building 443 boilers, so that the water is not mixed with wastewater from the demineralizers and therefore does not require treatment in Building 374. The project was completed in FY91 as a part of the Central Steam Plant Renovation.

- Optimization of the ion-exchange treatment processes in Building 771 to reduce the amount of waste water generated by the process.

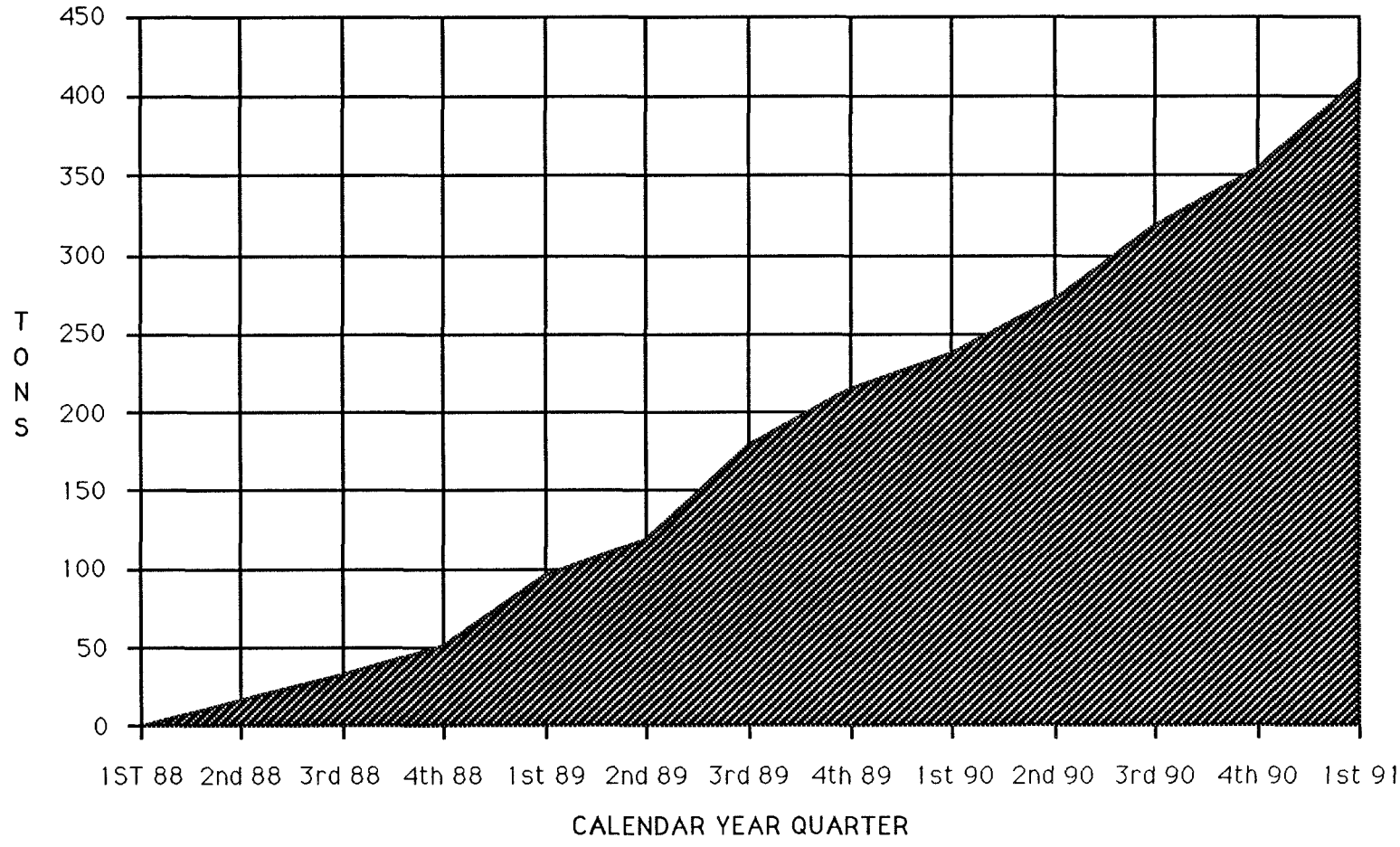
5.3.6 Solid and Sanitary Waste (ADS #5034)

Nonhazardous and nonradioactive waste forms have also undergone assessment at Rocky Flats for determining (1) methods to reduce their volumes and (2) where recycling might be feasible. Solid waste projects are focused on reduction of both sanitary wastewater and sanitary solid wastes such as office trash, packing materials, and cafeteria waste. Current projects are described below:

- Installation of shower heads that reduce water usage. Funding was requested in FY91.

- Recycling of a wastewater stream in Building 460 to the deionized water loop, resulting in a reduction of water usage and the water load to the Sewage Treatment Plant. The project is scheduled for completion in late FY92.

- Expansion of the paper recycling program to the Protected Area; this project was completed in FY91. A graph charting the growth of the paper recycling program is presented in Figure 5.2.



Rocky Flats Plant
Paper Recycling Program
Figure 5.2

- Installation of dishwashers in the cafeterias and purchasing dishes and flatware to reduce or eliminate the use of certain styrofoams and plastic disposable items. Two thirds of the plant's cafeterias will be converted by the end of FY91.

- Installation of hot-air hand dryers and replacing paper towels in all locker rooms and restrooms on plant site. The feasibility of this project was investigated in FY91.

5.3.7 Halogenated Solvent Elimination (ADS #5035)

Halogenated solvents are used primarily for cleaning plutonium and weapons components throughout various stages of production. These solvents are classified as RCRA hazardous materials and are subject to RCRA treatment, storage, and disposal regulations. The objective of the halogenated solvent elimination tasks is the reduction and ultimate elimination of the use of halogenated solvents on plant site. These tasks are briefly described as follows:

- Replacement of trichloroethane cleaning methods for oralloy and other non-plutonium parts with ultrasonic-assisted cleaning that uses an aqueous detergent. The technical feasibility study for this project is in progress.

- Replacement of carbon tetrachloride and trichloroethane currently used for cleaning oil and grease from plutonium weapons components with non-chlorinated solvents. A risk assessment study for this project was completed in FY91.

- Replacement of trichloroethane used for final cleaning of plutonium parts with a supercritical carbon dioxide cleaning process or an aqueous detergent solution. Installation of a pilot-scale unit will begin in FY92.

- Recycling of chlorofluorocarbons used in refrigeration units throughout the plant. Recycling equipment was purchased in FY91.

5.4 TREATMENT

The objective of waste treatment is to process and package liquid and solid waste generated at the site in a safe and effective manner. Treatment may reduce the hazardous properties of the waste or make the waste suitable for shipment and disposal. Waste handling operations deal with a multitude of waste types (e.g., TRU, TRU-mixed, low-level, low-level mixed waste, hazardous, and sanitary) and waste forms (e.g., liquids, sludges, solids, compressible solids). The majority of the process wastes generated at the site are

radioactive; thus, treatment and handling facilities have been designed to provide the additional safeguards necessary to effectively manage radioactive wastes. Treatment technologies include thermal, chemical, physical, immobilization, and waste solidification techniques. Nonradioactive spent oils, solvents, and other recyclable chemicals can be shipped to offsite vendors for treatment or reclamation. Office refuse and uncontaminated construction refuse are placed in the onsite sanitary landfill. Sanitary liquid sewage wastes are treated in the onsite sewage treatment plant. Waste minimization efforts are reducing the amount of waste to be treated and implementing recycling when possible (see Waste Minimization section).

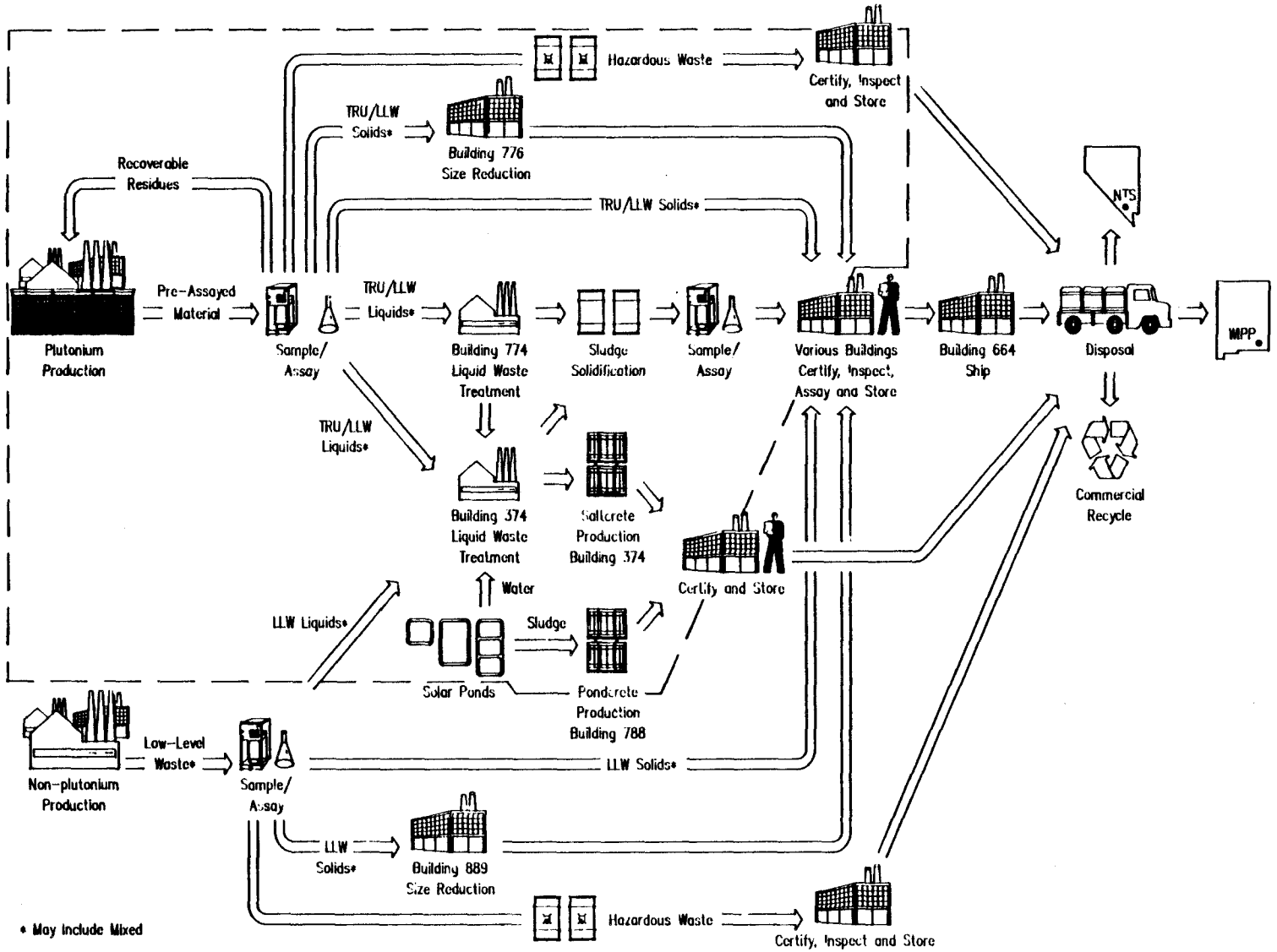
5.4.1 Waste Operations Treatment Facilities

The flow of waste at Rocky Flats is depicted in Figure 5.3. The five principal treatment facilities are described as follows:

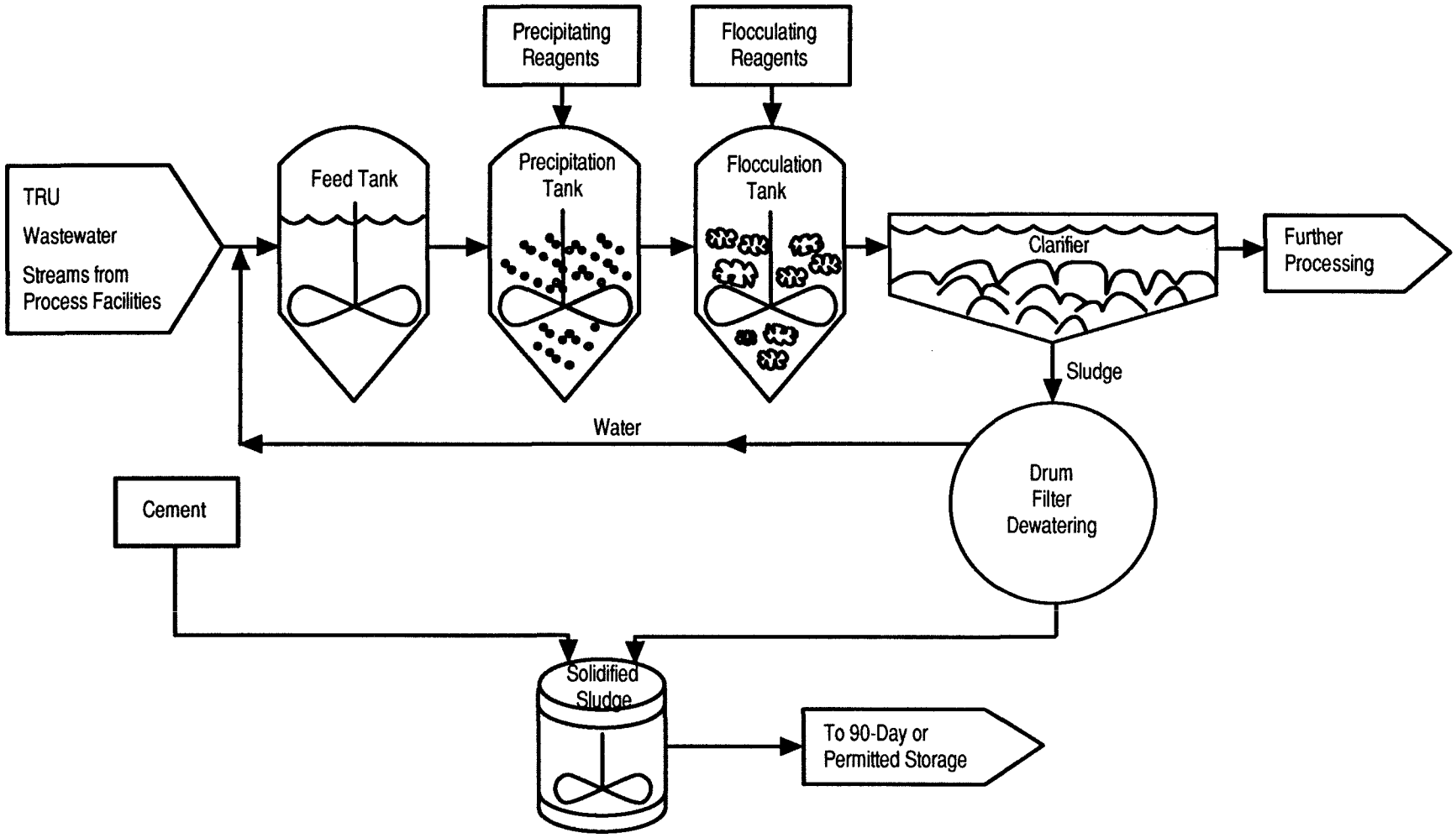
1. **Building 774** is used primarily for treatment of TRU and low-level liquid waste from production facilities in Building 771. The goal of treatment is to concentrate and solidify radioactive materials that may be radioactive; the remaining water is transferred for further treatment and eventual evaporation in Building 374. Categories of wastes treated in Building 774 include TRU and TRU-mixed caustic waste, acidic waste, and organic waste. ADS #3149 supports Liquid Waste Operations, Building 774.

   Three different treatment processes are used in Building 774. The type of treatment performed depends on the chemical nature of the waste to be treated. Caustic waste and certain neutralized acidic wastes are treated in a two-stage precipitation process. Chemicals are added to the wastewater stream and cause metals such as iron, magnesium, and calcium and radioactive contaminants to drop out of solution by forming a semi-solid precipitate. Clarified water is drawn off the top, and the precipitate is then de-watered and solidified.

   Organic wastes are solidified with gypsum cement. Wastes that cannot be treated by either of the above two methods are neutralized, then solidified with cement. A simplified version of the precipitation treatment process for TRU wastewater streams is shown in Figure 5.4.



Rocky Flats Plant
Waste Operations
Figure 5.3



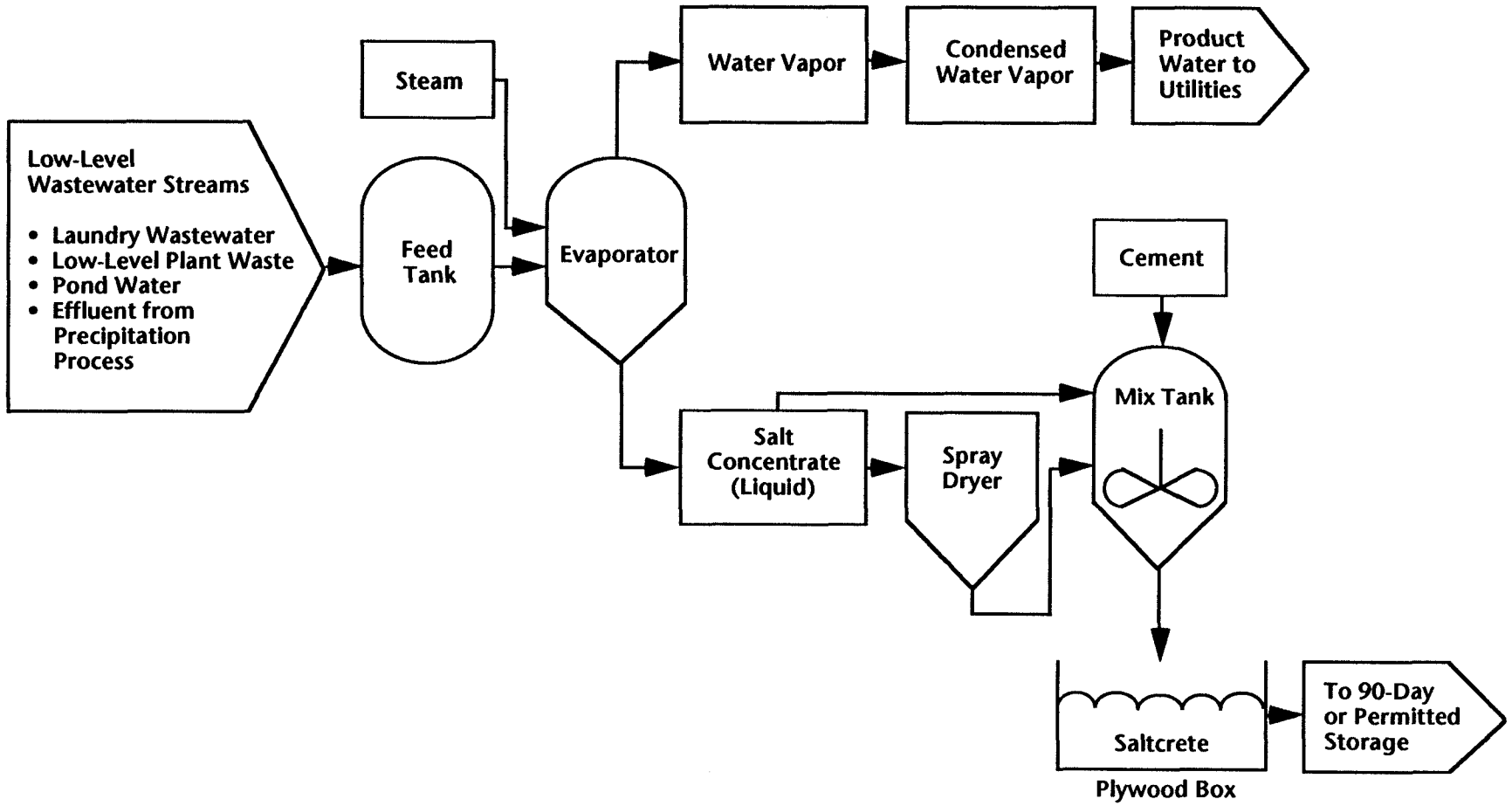
Precipitation Treatment Process for TRU Wastewater Streams

Figure 5.4

The facility also houses a silver recovery process in which silver is recovered from various waste streams generated on plant site. Additional support activities at this facility include sampling and transferring wastes, receiving waste from sources, and packaging solid waste products in preparation for storage and transportation offsite. Approximately 370,000 gallons of aqueous wastes are processed through this building each year.

2. **Building 374** is used for treatment of radioactive and nonradioactive wastewater from various sources on plant site. These wastes are converted into a solid waste form and water, which is used by Utilities in boilers and cooling towers. ADS #3148 supports Liquid Waste Operations, Building 374.

   The type of treatment used for each waste stream depends on the chemical constituents and the amount of residual radioactivity in the waste stream to be treated. Process water waste streams are treated in Building 374 with three different processes: (1) TRU waste streams are treated in a precipitation process, and the resultant sludge is solidified; (2) low-level waste streams are treated in an evaporation process, and the resultant salts are immobilized with cement, as shown in a simplified process diagram (Figure 5.5); (3) waste acids are neutralized, then treated in the precipitation process. Approximately 18 million gallons of aqueous wastes are processed through this building each year.



Evaporation Process for Low-Level Wastewater Streams
Figure 5.5

3. **Building 776** contains equipment for conducting waste reduction activities. Solid Waste Operations conducts routine handling, processing, and packaging of radioactive waste for most of the plant site. ADS #3169 supports Solid Waste Operations.

   Building 776 processing includes the following operations: (1) repackaging waste combustibles, metal, glass, and large HEPA filters; (2) adding cement for neutralization to waste filter media, insulation, and glovebox filters; and (3) size-reducing large items of equipment, machinery, and gloveboxes. The Supercompaction and Repackaging Facility (SARF) will be operational in early FY92.

4. **Building 889** is used for decontamination and volume reduction of uranium-contaminated equipment outside the Protected Area. After decontamination, much of the equipment is reused at other government-controlled facilities. Ducts, drums, and similar non-reusable items are cut, crushed, or otherwise processed to minimize volume and are packaged as low-level waste. A HEPA filter compactor is used to crush filters, and a baler (5 to 1 volume reduction) is used for compacting soft low-level waste.

5. The **Sewage Treatment Plant** is used for treatment of liquid sanitary waste produced at the site. The sanitary waste consists of wastewater generated from plant cafeterias, lavatory sinks, toilets, showers, and other drains located outside of the process areas. The sewage treatment plant must be operated in accordance with all applicable regulations for sewage treatment plants.

   Liquid sanitary waste is treated in an activated sludge process. The sludge produced is dried and packaged in lined plywood boxes. The purified water is pumped to ponds on Walnut Creek. Currently, packaged sludge is being stored onsite, pending approval for offsite disposal at the Nevada Test Site. The following tasks are included in sewage treatment plant operation: (1) observing and monitoring sewage treatment plant processes and responding to and adjusting treatment plant conditions as necessary, (2) mixing chemicals to maintain effluent quality and solids management, (3) sampling treatment plant processes, (4) monitoring and inspecting plant sewage collection systems, and (5) demonstrating compliance with DOE Orders and regulations.

5.4.2 Treatment Activities

Treatment activities included in the Rocky Flats FYP are described below. These activities have been divided into two categories: solidification activities and processing plant upgrades and renovation.

5.4.2.1 Solidification Activities

Solids are a waste treatment by-product common to many Rocky Flats processes. Solids are generated in the form of sludges from precipitation/filtration processes, salts from evaporation processes, and ash from past incineration processes. In some cases, current solidification practices do not produce waste forms that meet disposal requirements; therefore, new techniques are being developed.

The planned new solidification processes are currently in the research and development phase. After new technologies have been proven on a small scale, they will be transferred to production. Microwave solidification is one of the most promising new processes and is being developed to satisfy requirements of the FFCA for LDR waste. Microwave melting has been demonstrated to be capable of reducing waste volumes up to 80 percent more than cementation processes. Microwave process equipment should be easy to operate and maintain and will produce an improved waste form for transportation and disposal.

Process development is on schedule with the milestones established under the FFCA for LDR waste. Laboratory-scale verification of the microwave melting process has been completed on TRU waste samples, and cold pilot-scale and demonstration-scale testing and evaluation are in progress. Pilot-scale demonstration is planned to begin in FY91 and continue through early FY92. Technology Development testing is scheduled for completion in 1994. If preliminary successes continue, microwave solidification will replace cementation.

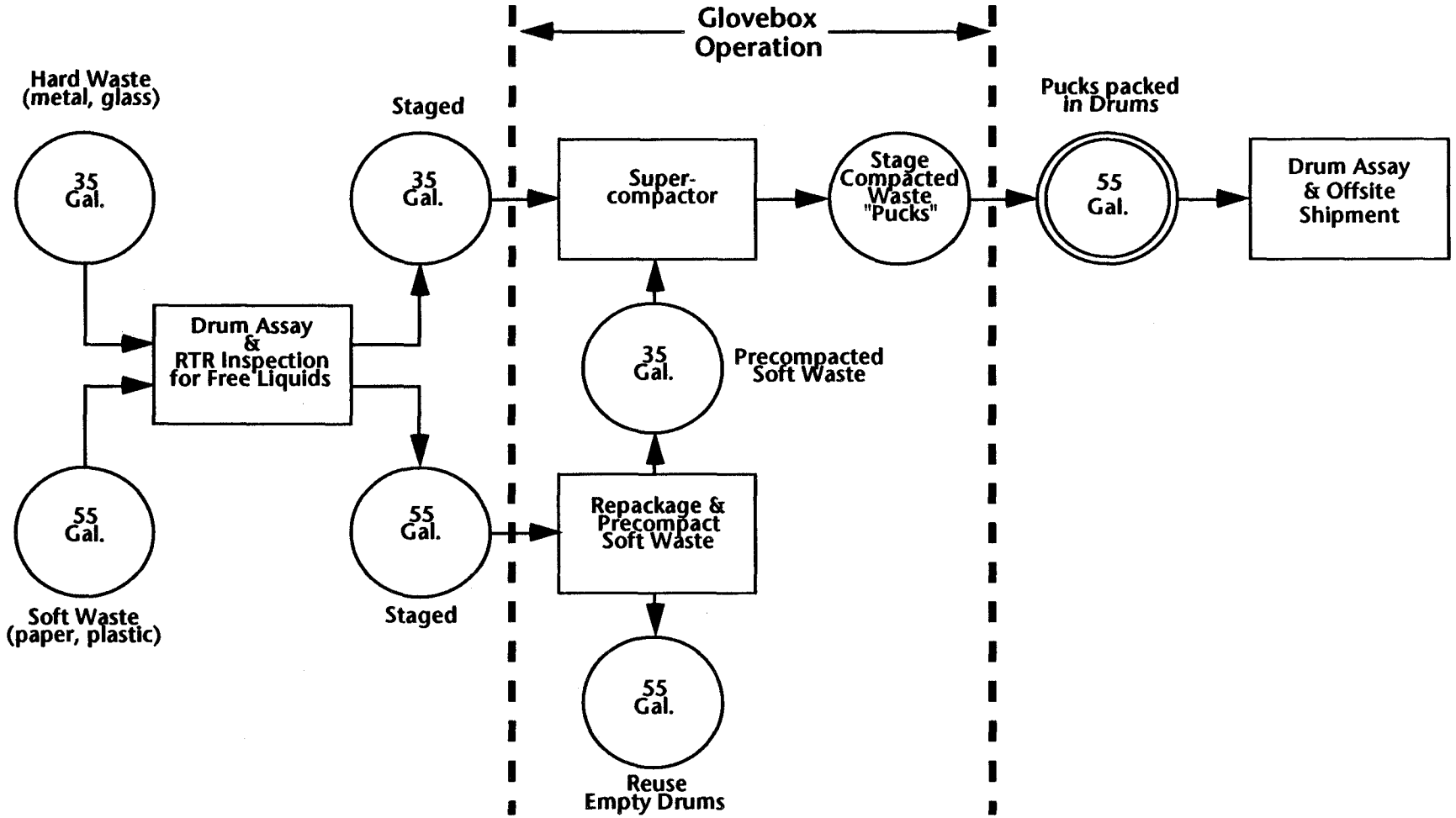
The first production-scale process will be installed in Building 774 (ADS #3166), beginning in FY93, with planned completion in FY94. Installations in Buildings 374 and 776 will follow (ADSs #3167 and #3400, respectively).

5.4.2.2 Processing Plant Upgrades and Renovation

Solid Waste Treatment Upgrades - Building 776

The Supercompaction and Repackaging Facility (SARF) in Building 776 will be used to compact and package solid TRU and TRU-mixed wastes generated during various site operations. This new facility will process both soft, combustible waste (such as paper and plastic) and hard, noncombustible waste (such as metal and glass). SARF equipment will be contained in a single, large glovebox; in addition, the SARF will allow repackaging operations to be performed from outside the glovebox, reducing exposure to workers. An overall 5 to 1 volume reduction of waste by SARF is expected. Figure 5.6 depicts the flow of the SARF process.

In FY91, construction and testing of the Supercompactor, procedure preparation and operator training, and the operational readiness review were completed. Start-up is planned for early FY92. Studies are underway to evaluate the feasibility of also using the SARF for compaction of low-level mixed waste.



Supercompaction and Repackaging Facility
Process Flow Diagram
Figure 5.6

Liquid Waste Treatment Upgrades - Building 374

Building 374 is a liquid waste treatment facility that has been in operation for 15 years. Age has made the facility technically outdated, and equipment upgrades and/or replacement are necessary. Facility upgrades will be implemented through the three activities discussed below.

1. The overall facility upgrade (ADS #3135) will include: replacement of the sludge immobilization system, a new chemical preparation ventilation system, a new distribution control and data acquisition system, new wastewater storage tanks, a product water tank, and a waste transfer system data collection system. These improvements will allow the building to operate at design capacity, with less down-time and maintenance. Most of the design criteria preparation was completed in FY91. Design and engineering will begin in FY93, and project completion is planned for late FY98.

2. The existing Building 374 evaporator is being augmented with a new evaporator (ADS #5178) in order to increase reliability and capacity. A capacity increase from 12 million gallons per year (although the present evaporator is designed for 20 million gallons per year, it operates at approximately 12 million gallons per year) to 23 million gallons per year is anticipated. The increased capacity will provide additional waste treatment support for plantwide liquid waste streams. The new evaporator will also incorporate design improvements, including:

   - Use of an alloy that can withstand the high levels of chlorides found in aqueous waste streams
   - Replacement of the current spray dryer with thin film evaporators for further concentrating salt concentrates from the evaporator
   - Installation of a ribbon mixer to blend cement into the concentrate from the thin film evaporators, creating a solidified waste product

   Much of the design work for the new evaporator will be completed in early FY92. Construction of the new evaporator system will occur in two phases. Phase I will include one thin film evaporator and its associated immobilization system. Phase I equipment will be installed in FY92, with start-up in FY93. Phase II will include the new evaporator and a second thin film evaporator/ immobilization system. Installation of Phase II equipment is scheduled for FY95, with start-up in early FY96.

3. Upon completion of the new evaporator system, the existing evaporator will be renovated to serve as a back-up and to provide additional capacity (ADS #3174). Major equipment required for renovation includes four special material heat exchangers, four new vapor bodies, pumps, piping, instrumentation, and electrical equipment. This project will also provide construction materials capable of withstanding anticipated chloride levels. The project is currently scheduled for completion by the end of FY98.

Liquid Waste Treatment Upgrades - Building 774

Activities that will upgrade liquid waste operations in Building 774 are planned for future years. The current organic waste process system is a pilot plant with no back-up, limited storage capacity, and extensive down-time. A new system is planned (ADS #3158) to replace the current one with a full-scale system capable of (1) maintaining a reliable on-line capability and (2) providing space for storage of accumulated waste for reasonable holding times. Completion of this project is currently scheduled for FY96.

The liquid waste processing system in Building 774 will be replaced. The current system, which was built in 1953, has caused excessive system down-time. Replacement of this system will reduce production down-time in Building 771 and will satisfy safety requirements in Building 774. The project (funded under ADS #3149) will include replacement of the following equipment: vacuum feed, precipitation, hydrochloric acid neutralization, nitric acid neutralization, filtration, scrubbing, and immobilization. Engineering and design will begin by late FY91.

Sewage Treatment Plant Upgrades

The Sewage Treatment Plant is undergoing extensive enhancement and upgrade in order to meet NPDES permit requirements. In FY91, instrumentation upgrades, including sensors, alarms, and process control and monitoring capabilities to the existing plant, were completed. An automatic chlorination/dechlorination system and improvements to the aeration basins were also added in FY91.

Engineering and construction of the Sewage Treatment Plant's facility upgrades will begin in FY92. These upgrades will include increased power availability, installation of a natural gas generator for power back-up, additions to two buildings, provisions for containing plant influent and effluent in the event of a spill, and overall evaluation of the existing facility, including a plan for rehabilitation.

The operations enhancement phase will be ongoing in FY92. This phase consists of four major components: (1) formality of operations through implementation of DOE Order 5480.12, "Conduct of Operations," (2) Sewage Treatment Plant process control development,

(3) safety analysis compliance, and (4) facility maintenance. Specific schedules and resources necessary for this phase were identified in FY91.

Baler Upgrade- Building 889

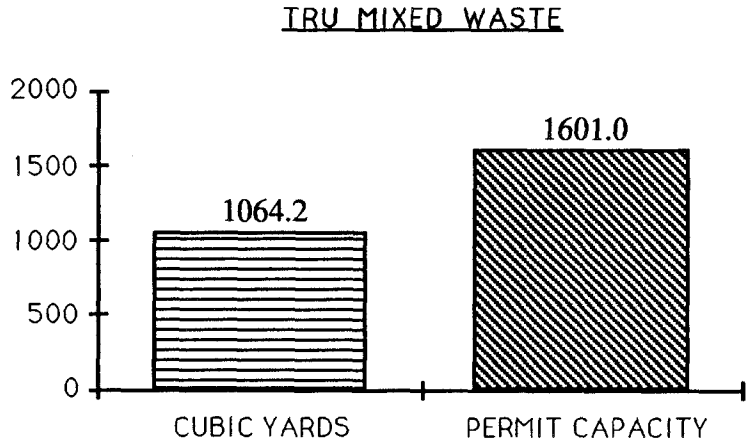
The baler located in Building 889 is currently being approved for processing of low-level waste (soft combustibles) generated outside the Protected Area. The baler could also be used for volume-reducing beryllium and low-level mixed wastes generated outside the Protected Area, but some or all of the following improvements will be required in order to meet applicable requirements (ADS #3408):

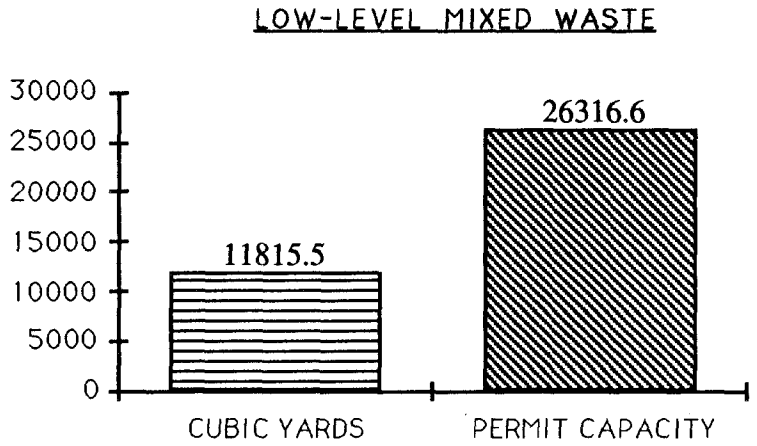
- Equipment must be upgraded and rearranged.
- Ventilation must be upgraded.
- Building modifications must be made to meet safety requirements.

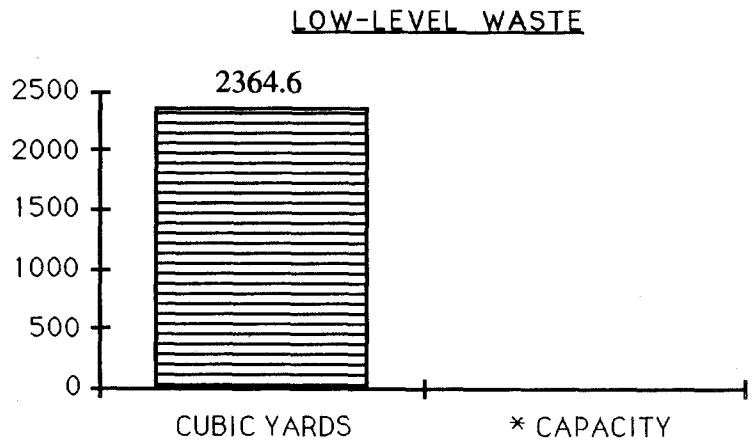
The initial phase of this project, which included a building addition and installation of two 2-stage HEPA filter plenums and a new ventilation unit, was completed in FY91. Completion of the entire project is planned for FY94.

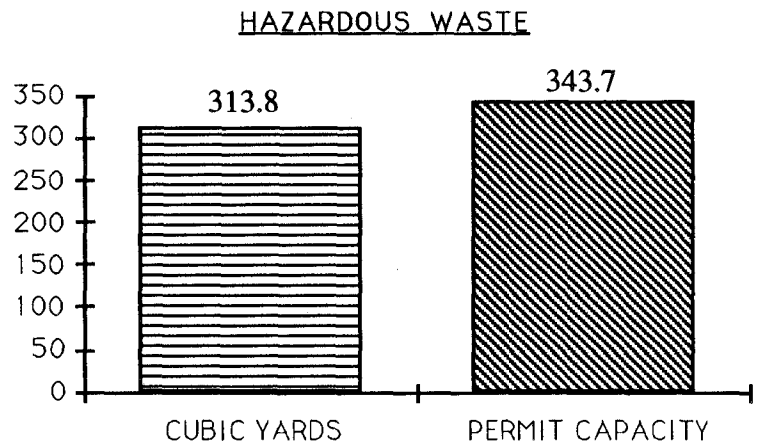
5.5 STORAGE

The Rocky Flats site generates several different categories of waste, as discussed above. Each category is uniquely affected by various regulations (e.g., RCRA and/or CDH regulations, DOE Orders), allowing for storage of varying amounts of the different waste types. Specific issues and constraints for storage of the different waste types are discussed below. Stored quantities as of mid-FY91 and permissible capacities are shown in Figure 5.7.









* Low-level waste has no permitted storage capacity.

Stored Waste Inventories as of April 14, 1991

Figure 5.7

5.5.1 TRU-Mixed Waste

Because of the RCRA regulations placed on hazardous wastes, storage restrictions are placed on mixed wastes at Rocky Flats. By agreement with the State of Colorado, Rocky Flats is limited to 1,601 cubic yards of TRU-mixed waste; however, Rocky Flats has set its own limit of 1,491 cubic yards as the point at which TRU-mixed waste generating operations would be shut down (called the limiting condition of operations [LCO]). At the current rate of generation, and without additional volume reduction, LCO will be reached in March 1992.

Several efforts to maximize the use of authorized storage at the site are under way. Aggressive efforts to minimize the amount of waste generated are showing results. Improved waste characterization is minimizing the amount of waste characterized as mixed, allowing segregation into TRU and low-level fractions that have less restrictive storage/disposal requirements. Finally, the Supercompactor, which will size-reduce both soft waste and hard waste, is being readied for operation in early FY92 and will effectively increase plant storage capacity for TRU-mixed waste. The Waste Isolation Pilot Plant (WIPP) facility is expected to begin receiving waste packages for the bin-scale test in September 1991, which will also ease storage limitations. With the above projects in place, the Rocky Flats would not reach its LCO until FY94.

DOE is developing the necessary NEPA documentation and safety assessments for the near-term option of storing wastes at various DOE sites. This effort will be completed before any Rocky Flats storage decisions are made. Interim storage of TRU-mixed waste at a commercial facility is also being investigated.

5.5.2 Low-Level Mixed Wastes

Rocky Flats' RCRA permits specify storage locations and the quantity of low-level mixed waste that can be stored onsite. Presently, Rocky Flats has a draft Part B permit for storage areas on plant site. The present permitted storage capacity for low-level mixed waste at Rocky Flats is 26,317 cubic yards, including interim status units currently storing pondcrete and saltcrete. As of November 8, 1991, no additional waste may be placed in the interim status units and the units will undergo RCRA closure. Permanent permitted capacity is 3,627 cubic yards, although actual physical storage capacity is only 1,509 cubic yards. Although aggressive storage optimization and waste minimization procedures have been pursued, LCO (1,479 cubic yards) may be reached by January 1992. In order to mitigate this situation, work is proceeding to upgrade the Building 889 Baler for processing low-level mixed waste. The use of SARF for completion of low-level mixed waste is also being investigated. Several waste storage expansion projects are planned, including additional capacity for low-level mixed waste. These projects are discussed in the following section. Low-level mixed waste is ultimately destined for disposal at the Nevada Test Site; disposal issues are further discussed in Section 4.6.2.

5.5.3 Storage Facility Expansion

A new 25,000-square-foot centralized waste storage facility, which will consolidate low-level, low-level mixed, and hazardous wastes, will be completed by early FY92 (ADS#5138). The new facility will fall under a modification to the Low-Level Mixed Waste Part B permit, the current RCRA permit and will safely store an additional 720 cubic yards of low-level mixed waste. Accordingly, the facility will improve the efficiency of waste storage operations and will extend Rocky Flats' storage capacity well beyond FY93.

A new 25,000-square-foot storage facility for low-level mixed waste will be built in FY92 (ADS #3150). This facility will be used as a temporary staging area for saltcrete, sewage sludge, and uranium oxide while these waste forms await shipment to the Nevada Test Site. The facility will be located near 904 Pad and will serve to consolidate and centralize stored waste from other existing storage areas.

Planned additions to several existing buildings will create more space for receiving and staging drums and crates as well as for storing wastes until disposal. Engineering and construction of a 2,100-square-foot addition to Building 569 (ADS #3136) are scheduled for FY92. The project will provide a dock and staging area for drums being processed through the new Real-Time Radiography machine.

In Building 776, conversion of a 4,800-square-foot maintenance shop to a waste receiving and staging area (ADS #3137) will relieve congestion around the Supercompactor, making the operation much more efficient. Conversion will be completed by early FY94.

Construction of a new 48,000-square-foot building (ADS #5064) for residue drum management and storage is planned. This facility will provide a centralized location for residue drum storage and will handle 7,500 drums. NEPA documentation for the building has been initiated, and building completion is planned for FY96.

5.5.4 Waste Handling

All waste forms (TRU, TRU-mixed, low-level, and low-level mixed) must be certified before they are allowed to be shipped offsite. The Waste Certification Organization is responsible for certification of waste containers (ADS #3260) to assure that the waste in the container is documented in accordance with applicable regulatory criteria. Waste that does not meet these criteria is rejected and returned to the generator, who must repackage the waste form according to applicable standards.

Waste Operations is responsible for daily storage, staging, and inspection of all wastes before they are transported offsite (ADS #3168, Solid Waste Operations, non-Protected Area). Activities include (1) preparation of waste packages to meet applicable acceptance criteria; (2) preparation of documentation for waste packages per acceptance criteria; (3)

inspection of all waste packages to assure that storage procedures are being followed and that the waste meets applicable acceptance criteria; (4) staging and loading waste packages onto transportation vehicles for offsite transportation; (5) ensuring that stored waste does not exceed permitted storage capacity; (6) performance of audits, inspections, and other activities to assure compliance; and (7) recharacterization and recertification of backlog wastes.

5.6 DISPOSAL

Rocky Flats does not dispose hazardous, low-level, low-level mixed, TRU, or TRU-mixed wastes on plant site. All wastes (except sanitary waste) are or will be shipped offsite for ultimate disposal.

The main goal of transporting waste from the site is to dispose wastes in a safe and economical manner that will not adversely affect the environment. The Traffic Department coordinates shipment of waste packages from the site under the authority of DOT regulations and DOE requirements. Operating procedures define transportation methods for the various categories of waste containers.

The major constraint placed on waste disposal is the ability of the disposal sites to acquire regulatory approval to store and dispose mixed waste. Dual regulatory disposal requirements are applicable to mixed wastes (RCRA and the Atomic Energy Act). The LDRs (40 CFR 268) that fall under the Hazardous and Solid Waste Amendments (HSWA) to RCRA established treatment standards that must be met in order to land dispose various substances. The LDRs prohibit disposal of certain untreated hazardous waste either in or on the land unless it can be demonstrated that the toxicity of the waste has been substantially diminished or that there will be no significant migration of hazardous constituents for as long as the waste remains hazardous.

5.6.1 TRU Waste

TRU and TRU-mixed waste generated at Rocky Flats before 1970 was disposed underground at Idaho National Engineering Laboratory (INEL). After 1970, this waste was shipped to INEL for interim storage until a permanent disposal facility became available. As a result of delays in opening the WIPP facility in Carlsbad, New Mexico, the State of Idaho closed its borders in October 1988 to further receipt of waste shipments from Rocky Flats, forcing Rocky Flats to continue storing TRU/TRU-mixed waste. The maximum RCRA-permitted storage limit for TRU-mixed waste at Rocky Flats is 1,601 cubic yards. In order to avoid reaching this limit, Rocky Flats must provide alternative, fully compliant storage capacity until a permanent disposal facility becomes available. Rocky Flats can avoid the near-term shipment of waste to an interim storage facility if the WIPP bin-scale test phase begins and if the Supercompactor becomes operational by mid-FY92.

The WIPP facility is expected to begin receiving Rocky Flats waste shipments for use in the bin-scale contact-handled TRU waste test program in late FY91. In order to provide waste for use in this test, certain waste characterization requirements must be met. Rocky Flats will be required to perform nondestructive assay and inspection; analytical, visual, and physical characterization; and segregation of the contents of each container of TRU waste. To support these requirements, Rocky Flats is currently developing procedures and a training and evaluation program for recognition of waste types.

Additional requirements have been imposed by the QAPP for the WIPP Waste Characterization Program, EPA, and the New Mexico Environmental Improvement Division. These requirements include determination of the concentrations of gases and VOCs in the headspace of each waste container and every layer of confinement within a container. Full RCRA characterization of the waste will probably be required, and Rocky Flats is developing methods, procedures, training and sampling techniques, and a data management system that support these requirements.

The characterization program, including all the preparatory steps, samples, and analyses, must be controlled in accordance with WIPP requirements. Basic criteria are identified in the QAPP for the WIPP Waste Characterization Program. Rocky Flats is developing a detailed description of management, waste certification, and waste characterization functions and additional quality-related objectives for the WIPP program.

When all of the above requirements have been met, Rocky Flats can begin to prepare bins for shipment to the WIPP facility. It is anticipated that up to 146 bins of waste will be prepared at Rocky Flats for shipment to WIPP. These bins will be overpacked in specially designed shipping vessels known as TRUPACT-II containers.

The TRUPACT-II vessel is a rugged, light-weight double container. The inner containment vessel is a leak-tight, stainless steel pressure vessel. The outer containment assembly is multilayered, consisting of inner and outer stainless steel shells lined with heat-resistant ceramic fiber paper and surrounding fire-retardant polyurethane foam. The TRUPACT-II vessel has met all specifications and passed all required evaluations and testing for certification as a Type B container by the Nuclear Regulatory Commission. It is currently certified for truck transport only.

A facility to load TRUPACT-II containers onto trucks is needed in the near term to support the planned bin test shipments to WIPP. Building 664 is currently being modified to accommodate shipment of TRUPACT-II containers. This is an interim measure that will be used for up to six years and is scheduled to be operational in late FY91. The long-term facility will be designed to consolidate TRU waste operations as well as to provide a TRUPACT-II loading facility.

Rocky Flats will continue to meet the WIPP Waste Acceptance Criteria for certification for Rocky Flats TRU waste generated and packaged during FY92. These wastes will then be ready for future production shipments to WIPP.

5.6.2 Low-Level Wastes and Low-Level Mixed Wastes

DOE/Nevada suspended shipments of low-level waste to the Nevada Test Site because of procedural control deficiencies noted during the DOE Nevada Test Site operations audit conducted in July 1990. In FY91, the Waste Programs organization at Rocky Flats corrected noted deficiencies and enhanced the overall low-level waste certification program. Completed activities included:

- Revision of the waste container data collection program
- Development of a new training program for waste generators
- Revision of operational procedures for waste packaging
- Enhancement of inspections and program surveillance
- Publication of plantwide waste stream characterization documents

These activities were initiated in all 14 radioactive waste generating buildings, beginning in January 1991. Shipments of low-level waste are expected to resume in late FY91.

Low-level mixed waste shipments to the Nevada Test Site were suspended in May 1990 when the RCRA LDRs went into effect. In order to transport and receive wastes, the Nevada Test Site was required to prepare an Environmental Assessment, obtain a Finding of No Significant Impact (FONSI), and develop and implement a waste analysis/ characterization plan. These activities were completed in the third quarter of FY91. The Nevada Test Site must receive RCRA interim status or be permitted and complete minimum technology requirement upgrades. Completion of these requirements is anticipated by the end of FY92. Permit applications for some low-level mixed wastes will be submitted in preparation for shipment to the Nevada Test Site in FY92.

Low-level and low-level mixed wastes are shipped in Type A packaging, which is designed to withstand normal conditions of transport without loss or dispersal of its contents. Plywood boxes are commonly used for storage and shipment of Rocky Flats low-level and low-level mixed wastes.

Low-level and low-level mixed wastes are products of several different treatment processes at Rocky Flats and therefore vary in nature and must come into compliance with Nevada Test Site's waste acceptance criteria on a case-by-case basis. Four major low-level/low-level mixed waste forms are currently undergoing the approval process. All of these waste forms must meet all waste acceptance criteria for disposal at the Nevada Test Site. Two of the principal criteria are (1) absence of free liquids and (2) limited presence of fine particulate matter. These waste streams are discussed below.

The FFCA for LDR wastes signed by EPA, the State of Colorado, and DOE established a schedule by which the site would come into compliance with LDRs for mixed-waste treatment and disposal. The agreement defined a series of reports and documentation to be completed by the end of September 1990, including inventories of all mixed wastes stored and produced at the site, a minimization plan, and treatment reports and plans. All reports were completed as required. A new, two-year FFCA between DOE and EPA was signed on May 10, 1991; negotiations are still in progress between DOE and CDH, who will gain authority over some LDR wastes in late FY91.

5.6.2.1 Saltcrete

Saltcrete is the low-level mixed waste form originating from the low-level wastewater evaporation system. The brine resulting from concentration of wastewater by the evaporator is dried to a low-level mixed salt and then re-mixed with brine and cement. The result is a solid waste form called saltcrete, which is packaged for shipment and disposal in plywood boxes. Revised standard operating procedures for sampling this waste form were submitted to DOE/NVO in January 1991. Sampling and analysis of stored and newly generated saltcrete will begin as soon as the standard operating procedures are approved. Shipments of newly generated saltcrete are expected to begin in mid-FY92, followed by shipments of stored saltcrete in early FY93.

5.6.2.2 Sewage Sludge

Sewage sludge is the solid by-product of the sanitary wastewater treatment process at Rocky Flats. It is currently identified and managed as a low-level waste. The current operation used drying beds to dry the sludge. The drying process is slow and is incapable of processing current waste quantities to an acceptable moisture content. A mechanical de-watering and drying system is being installed to enable the Sewage Treatment Plant to consistently produce a waste form that meets applicable requirements. Shipment of sewage sludge is expected to begin in early FY92.

5.6.2.3 By-Pass Sludge

By-pass sludge is a low-level mixed waste product derived from a precipitation process used to remove radioactive contamination from process wastewater streams in Building 374. Currently, the precipitate from the clarifier (see Figure 5.4) is dewatered and packaged with

an absorbent to produce by-pass sludge. Characterization results indicate that the resulting waste form does not comply with land disposal treatment standards and is not acceptable for disposal at the Nevada Test Site; therefore, a new immobilization process is being developed to create an improved waste form. The bench-scale phase of process development is scheduled for completion at the end of FY92. Production implementation and shipment to the Nevada Test Site are scheduled for FY97.

5.6.2.4 Roaster Oxide

Roaster oxide is generated in a thermal treatment process, which heats uranium chips (by-product from machining operations) to approximately 650 degrees centigrade, the temperature at which sustained burning of the material occurs. The pyrophoric nature of the uranium is eliminated as it is converted to uranium oxide. Shipments to the Nevada Test Site were halted in 1986 as a result of compliance issues pertaining to RCRA. It was later determined that the roaster oxide contains hazardous components and that this waste stream must therefore be handled as low-level mixed waste, meeting all applicable waste acceptance criteria. After 1988, RCRA F-listed solvents were eliminated from the process that generates the waste uranium; EG&G has therefore recommended to CDH that all roaster oxide generated after that time be classified as strictly low-level waste.

An evaluation and sampling procedure for low-level and low-level mixed roaster oxides is being developed and will be audited by the Nevada Test Site. Low-level and low-level mixed roaster oxides are scheduled for approval by the Nevada Test Site in mid-FY92, and the first shipment is anticipated in mid-FY93.

5.6.3 Hazardous Wastes

Hazardous wastes are to be shipped to various commercial vendors for disposal as soon as an agreement with CDH can be obtained for methodologies to be used to classify waste as non-radioactive. In FY91, DOE and CDH agreed on radioactivity limits for waste garage oils; this waste form is now being shipped to a commercial vendor for recycle.

5.6.4 Sanitary Wastes

The sanitary landfill accepts all nonhazardous nonradioactive solid waste on plant site. Operation of the landfill involves site excavation as well as depositing and covering solid wastes.

The landfill, which began operations in 1968 and is expected to reach capacity in November 1993, will be replaced by a new landfill (ADS #3153). Closure of the landfill is a requirement of the IAG (see Environmental Restoration section). A site for the new landfill has been recommended by the preliminary conceptual design document.

Construction of the first cell is scheduled to begin in March 1993, with completion scheduled for December 1993. There will be a total of four cells constructed, each with an expected life of five years.

Until the new landfill is in operation, several steps are being taken to extend the life of the current landfill:

- Paper is being recycled whenever possible.
- Solid waste will be contoured and mounded to provide additional capacity.

6.0 TECHNOLOGY DEVELOPMENT

6.1 OVERVIEW

Technology development is a systematic approach to identifying, testing, evaluating, demonstrating, and implementing innovative or existing technologies that will allow Rocky Flats to better satisfy established goals in the areas of environmental management, waste treatment/storage, and waste minimization.

The Technology Development program is managed at DOE/Headquarters through DOE/OTD. The principal mission of DOE/OTD is to provide new technologies by increasing investment in and improving the management and coordination of DOE's technology development activities. This mission will be accomplished by cooperating closely with the Waste Management and Environmental Restoration Offices at DOE/Headquarters and by using all internal and external resources available.

Technology development is a phased process in which individual technologies undergo rigorous evaluation before passing from one phase to the next. Following problem prioritization and technology ranking and selection, a technology must pass through six phases before it is implemented into routine operations: (1) basic research and development, (2) applied research and development, (3) process development, (4) demonstration, (5) testing and evaluation, and (6) implementation. The Rocky Flats Technology Development program is involved primarily with phases 2 through 6. The success of research and development is measured by implementation.

Because of the uncertainties associated with research and development efforts, relatively few technologies that are investigated in the early stages of development are suitable for full implementation. Therefore, to ensure that the needs of Environmental Restoration and Waste Management are met at Rocky Flats, several technologies that address the same problem may be investigated. As the technologies progress through the development phases, those that prove to be technically unsuitable will be eliminated from future funding and development. Also, funding may be limited and some projects may be deferred or eliminated so that more promising projects can be supported. It is expected that at least one technology addressing a given problem will be successfully developed and will be implemented into routine operations. The following discussion summarizes the technology development strategy and briefly reviews technology development activities currently planned at Rocky Flats.

6.2 TECHNOLOGY DEVELOPMENT ACTIVITIES

To accomplish the Technology Development objective, projects are needed to:

- Minimize production of new waste by using fewer hazardous materials, by recycling process chemicals and materials, and by substitution of more durable materials and equipment into process operations
- Create waste forms suitable for land disposal as required by the FFCA for LDR waste
- Better characterize and assay waste forms
- Enhance environmental and personnel real-time monitoring
- Characterize and remediate contaminated sites, and restore and maintain environmental quality
- Provide a management framework that will ensure progressive technology development and an increasing supply of professionals trained in environmental restoration and waste management technologies

At Rocky Flats, the following groups of activities are being carried out to address environmental restoration, waste treatment, waste minimization, and waste storage needs.

Waste Minimization

The primary objective of this group is to investigate technologies that would minimize Rocky Flats' process waste. Targeted wastes are primarily chlorinated solvents used to clean machine coolant from plutonium and non-plutonium metals. The resulting waste is a radioactively contaminated RCRA hazardous liquid. Technologies being investigated to reduce or eliminate this waste include liquid (supercritical) carbon dioxide cleaning, aqueous cleaning, dry machining, centrifugal separation of machining oils, and the use of non-chlorinated solvent cleaning. Minimization techniques such as reusable metal molds, as they pertain to metal fabrication, are also being investigated. These activities are included under ADS #4205, #3245, #4234, #4237 A/B, #4802-4817, #4819, and #4820.

Plutonium Processing

The primary objective of this group of activities is to optimize plutonium processing, thereby reducing generated waste and minimizing personnel exposure. Tasks include development of direct oxide reduction as the preferred method to convert plutonium oxide to plutonium metal, modification of the electrorefining process to allow replacement of magnesium

chloride with dicesium hexachloroplutonate, and replacement of the matrix electrolyte. Electrorefining optimization will result in a 30-percent increase in productivity and a corresponding decrease in process waste generation. These activities are included under ADS #4801, #4804-4809, #4811-4813, #4818, and #4819.

Waste Treatment and Stabilization

The primary objective of this group of activities is to research, develop, and implement technologies capable of providing a waste form acceptable for long-term waste disposal repositories. Technologies include thermal treatment, alternatives to thermal treatment (e.g., bioremediation, ultraviolet/ozone treatment, electrolytic oxidation), microwave melting, small-scale cyanide destruction, and investigation of suitable solidification and stabilization technologies. These activities are included under ADS #4215, #4111, #4200, #4118-B, #4119, #4108 B/C, #3401 B/C, #4105, #4216 A/B, and #4236.

Waste Characterization and Sorting

The primary objectives of this group of activities are to (1) develop mixed-waste analytical procedures and (2) improve waste assay procedures to more effectively sort low-level waste from TRU wastes. Additional tasks involve development of environmental data acquisition capabilities to assure compliance with regulations and agreements pertaining to Rocky Flats. These activities are included under ADS #4222, #4208, #3301, #4211, and #4101.

Technology Development - Administrative and Planning

The primary objective of this group of activities is to provide program management, project support, and administration for Technology Development. Other tasks include implementation of an outreach program encouraging minority and disadvantaged youths to pursue technical careers in environmental management, staging technical integration industrial workshops across the DOE system (focusing on waste management and environmental restoration), formulation of a Technology Investment Strategy, and initiation of a Technology Development Total Quality Program. These activities are included under ADS #4206, #4217, #4218, #4221, #4225-4232, #4234, and #4235.

Many of these projects are scheduled to receive funding in FY92, but not every activity will be funded and worked in FY92. Non-funded projects may be deferred to FY93 or beyond, depending on priority and ultimate technology ranking. Currently, activities specifically addressing the characterization and remediation of the contaminated site have not been defined or funded.

6.3 TECHNOLOGY INVESTMENT STRATEGY

Rocky Flats needs new technology to solve its waste and environmental problems. New technologies must reduce or eliminate waste generation at the source or must treat backlogged and newly generated wastes and residues to render them environmentally acceptable for land disposal. New technologies will also play a role in remediating water and soils, monitoring for potential emissions, and limiting hazardous and radioactive contamination.

Any new technology needed to solve a problem at Rocky Flats will require specialized implementation. "Off-the-shelf" solutions to hazardous waste problems are generally inadequate because they rarely address radiological concerns associated with mixed-waste treatment and environmental remediation at Rocky Flats.

A strategy known as the Technical Investment Strategy (TIS) is required at Rocky Flats to properly focus, plan, and implement new technologies. TIS seeks to define and develop an overall systematic approach to solving the waste and environmental problems at Rocky Flats. With an overall approach, Rocky Flats intends to make plans and directions clear to the public, regulators, and DOE.

While acknowledging the time constraints imposed by regulations and compliance agreements, TIS is providing guidance for development and implementation of the most cost-effective technologies wherever possible. The strategy will seek to leverage Rocky Flats efforts with technical research and development efforts at other DOE laboratories, universities, and, when applicable, private-sector companies.

TIS is an integrated approach with the intent of enabling DOE/Headquarters to allocate appropriate levels of resources to address the site's waste and environmental problems or to take the lead in bringing expectations and agreements into accord with time and resources available to EG&G Rocky Flats. Completion of the first TIS is planned for late FY91 and will include the following:

- Identification and prioritization of Rocky Flats' most significant problems. TIS will develop a methodology to identify the most important large-scale waste and environmental problems. This method considers the potential risk of more than 100 Rocky Flats problems to the public and the environment, the potential risk of the problems to worker safety, and the potential for fines and/or criminal sanctions due to non-compliance with RCRA regulations. This ranking process indicated 26 high-priority problems that required concentrated effort to solve; after some analysis and refinement, this list has been reduced to 10 broad-based problems requiring concentrated effort to solve.

- Identification of the technologies that are most likely to provide timely, effective solutions to the most significant problems.

- An assessment of the documentation and other constraints that must be addressed before or during implementation of treatment or minimization technology options. The assessment will establish the time needed to complete the required waste characterization, environmental monitoring, facilities engineering, and funding process and to address waste acceptance criteria, federal and state regulations, and any plan requirements or operational needs. The goal of this assessment is to identify methods that can streamline the technology development process and to use teamwork to more effectively implement crucial technologies.

- Recommendations for using expertise and facilities available within the DOE complex, the private sector, and universities to meet the site's most important environmental and waste objectives. With limited resources, Rocky Flats is planning to use leadership through Integrated Demonstration programs to steer the development efforts of others to meet Rocky Flats' needs.

- Recommendations for investing varying levels of funding to achieve correspondingly effective results.

6.4 WASTE MANAGEMENT PROBLEM RANKING AND ALTERNATIVE SOLUTIONS

As indicated above, the first step in TIS is to identify and prioritize activities accordingly. Technology Development examined and ranked 123 problem statements. After several iterations, EG&G Rocky Flats has identified and prioritized the following 10 waste management problems as requiring concentrated effort.

For each problem, several alternative solutions are being developed. Each alternative will then be evaluated and ranked on the basis of success criteria that have yet to be established. Alternative solutions are listed as they relate to each problem. More than one solution may be applied to each problem.

Problem descriptions and Technology Development projects that address the particular problem are listed below.

Problem 1 Description:

Historically, Rocky Flats manufacturing operations have generated approximately 25,000 gallons of TRU and low-level machining coolants and other solvents annually. These coolants and solvents pose a potential safety hazard because some can

permeate through the plant's radiation protection gloves, thereby exposing workers to the solvent's vapors. Some of the solvents cause the waste from production lines to become RCRA LDR waste and/or comprise releases to the atmosphere that violate the 1990 Clean Air Act amendments. Rocky Flats has a significant backlog of these wastes.

Solutions:

1. Nontoxic organic solvent substitution
2. Aqueous cleaning
3. Supercritical fluids to replace chlorinated hydrocarbons
4. Liquid carbon dioxide (CO2) cleaning
5. Thermal treatment process unit
6. Controlled air incinerator
7. Molten salt incinerator
8. Joule melter (mixed-waste destruction)
9. Scrubber/absorber
10. Dry plutonium machining
11. Magnetic separation to remove plutonium
12. Hydrocyclone filtration
13. Biodegradation of organics
14. Mediated electrolytic oxidation
15. Silent discharge plasma
16. Ultraviolet oxidation

Problem 2 Description:

Quantitative waste drum head space gas composition analysis indicates that stored organic sludge drums may have hydrogen gas concentrations exceeding 5 percent if not properly vented. This exceeds the Nuclear Regulatory Commission Certificate of Compliance TRUPACT II container limit.

Solutions:

17. Carbon composite filtration
18. Improve drum/crate counter
19. Thermally treat stored organic sludge

Problem 3 Description:

Rocky Flats is not in compliance with certain RCRA requirements relating to residues. RCA between DOE and CDH outlines a plan to achieve compliance and requires that the following problems be addressed:

- There are residues in the backlog that cannot be processed because there are no treatment methods available for the RCRA-regulated components of the residues.

- Recovery of plutonium from residue-level machining coolant in Building 707 generates TRU wastewater in the form of residue filter cartridges, which have no treatment process and corrode storage drums.

- Some plutonium recovery processes in Building 771 expose personnel to radiation and result in only marginal waste reduction.

Solutions:

20. Minimize residue production with waste minimization goals in restarted Building 771
21. Develop technologies to treat RCRA-regulated components of residues
22. Develop technologies that recover radionuclides from the residues without generating difficult-to-treat secondary waste streams

Problem 4 Description:

Rocky Flats manufacturing operations generate large quantities of TRU-mixed and low-level mixed wastes. Present treatment processes generate RCRA hazardous wastes at a rate that would cause stored inventory to rapidly approach the 1,601-cubic-yard limit for TRU-mixed waste storage. Resumption of Buildings 559, 707, 776, 779, and 771 operations will cause Rocky Flats to rapidly approach the TRU-mixed waste storage limit, and the low-level mixed storage limit.

Solutions:

23. Cement solidification development
24. Impregnate saltcrete with polymer
25. Encapsulate salt using low-density polyethylene
26. Recycle nitric acid
27. Implement hydrochloric acid dissolution/recycle
28. Separate plutonium with additives
29. Microwave melting
30. Biodenitrification
31. Electrolytic reduction

Problem 5 Description:

Waste characterization:

- Process knowledge is not deemed acceptable to regulators to satisfy regulatory and treatment drivers. The composition of the wastes should be known with a 95-percent confidence level. This problem affects Rocky Flats' ongoing waste generation as well as stored waste.

- EPA has not fully developed analytical methods to characterize mixed wastes.

- Rocky Flats does not have the equipment or space to perform laboratory analysis required to characterize many of its radioactive and hazardous mixed waste streams.

- The laboratory procedures currently approved by EPA for hazardous and radioactive mixed waste streams generate substantial volumes of secondary waste streams that require treatment and disposal. Also, many are not feasible for use in glovebox environments.

Solutions:

32. Develop mixed-waste analytical methodologies
33. Develop sampling techniques to adequately sample heterogeneous wastes
34. Develop technologies that certify the 95 percent confidence level for waste streams at the time of waste generation and that are acceptable to regulators
35. Seek to develop additional laboratory capacity offsite or by improving the throughput of existing Rocky Flats laboratories

Problem 6 Description:

Normal operations at Rocky Flats generate large quantities of combustible solids (residues, TRU waste, and low-level waste), which are being stored pending appropriate treatment technologies. Most of these combustibles are mixed waste. There are presently no permitted treatment technologies or disposal repositories that can accept the waste, and interim storage space at Rocky Flats is approaching capacity (refer to Figure 5.7).

Solutions:

36. Develop thermal treatment technologies
37. Develop alternatives to thermal treatment
38. Implement solid-state paint stripping
39. Waste minimization

Problem 7 Description:

Measurement and instrumentation technology does not fully exist to provide continuous monitoring of air, surface water, groundwater, and wastewater pollutants to allow quick notification and response to upset conditions.

Solutions:

40. Develop/investigate/implement field instrumentation and communications network

Problem 8 Description:

Present available treatment technologies to remove organics, inorganics, and radionuclides from surface waters cannot meet all current or anticipated regulations from the State of Colorado.

Solutions:

41. Plutonium/heavy metal removing additives
42. Plutonium flocculation
43. Filtration
44. Advanced charcoal absorption
45. Ultraviolet oxidation
46. Biodegradation

Problem 9 Description:

Periodic replacement of raschig rings in solution storage tanks generates TRU waste. The waste may be mixed, depending on the type of solution waste stored in the raschig ring tank. Raschig rings are presently not treated and/or recycled and account for approximately 4 percent of the total TRU waste category. No disposal repository concurrently accept this waste.

Solutions:

47. Chloride leaching
48. Air/steam stripping
49. Liquid CO2 cleaning

Problem 10 Description:

There is a need to reduce the silver concentration of wastewater discharged from Buildings 444, 460, 707, 779, and 991 film processing to the Building 374 evaporator. Silver is a RCRA toxicity characteristic contaminant that further complicates saltcrete disposal.

Solutions:

50. Precipitation
51. Ion exchange/advanced ligands
52. Reverse osmosis
53. Commercial technology

6.5 TECHNOLOGY DEVELOPMENT ACCOMPLISHMENTS

The following are major Technology Development accomplishments for the first three quarters of FY91:

- Microwave melting process patent awarded
- Completed Draft TIS
- Estimated office and hot and cold laboratory space requirements
- Implemented more effective Technology Development organization
- Completed mixed-waste integrated demonstration proposal
- Initiated an off-gas treatment coordination team
- Completed installation of microwave melter pilot-scale system and initiated testing

The following are major Technology Development accomplishments planned for the next fiscal year:

- Complete microwave melter equipment reliability assessment
- Completed microwave melter pilot-scale system operating test
- Procure, install, and initiate testing of a liquid carbon dioxide cleaning system
- Initiate bench-scale testing of polymer solidification

6.6 TECHNOLOGY DEVELOPMENT ACTIVITY TABLES

Fifty-seven activities related to technology development were funded in FY91, and many will be funded in FY92. These activities are described in ADSs and are assigned an activity number. The table on the following pages summarizes the information on Technology Development activities by providing the ADS title, the waste type it is related to, the waste

management problem identification number, and the technology alternative number. Pertinent information regarding data listed in each column of the table is provided as follows:

- **Waste Type:** Each technology will address one or more of the following waste types:

  TRU - transuranic
  LLW - low-level
  TRM - TRU-mixed
  LLM - low-level mixed
  RES - residue
  HAZ - RCRA hazardous
  NA - not applicable (ADS does not address a specific waste type)

- **Waste Volume:** Identifies the quantity of waste (generated and stored) that the ADS addresses. Generated waste figures reflect the most recent year of production (1988).

- **Problem Number:** Identifies specific problem(s) the ADS addresses.

  1-10 - problems as specified above

  other - problem identified, but not prioritized, in the top 10

  WMin - ADS addresses waste minimization concerns beyond those specified in problems 1-10

  ( ) - Problem indirectly addressed by the ADS (e.g., waste minimization indirectly affects waste characterization requirements)

- **Technology Alternatives (as identified 1-54 above):** Not all 54 technology alternatives are currently being explored as part of an ADS; thus, not all alternatives (numbers) are listed.

- **FFCA:** A regulatory driver with possible fines or imprisonment penalties for missing time constraint milestones for the ADS.

ADS	ACTIVITY TITLE	WASTE TYPE	GENERATED WASTE VOLUME (cubic ft x 1000)	STORED WASTE VOLUME (cubic ft x 1000)	PROBLEM NUMBER	TECHNOLOGY ALTERNATIVE NUMBER	FFCA
3245	Final Pu Cleaning With Supercritical Fluids	HAZ, LLM TRM	3	4	1,4,(5)	1-16,23-32	YES
3301	Drum Counter Improvement Upgrades	TRU, LLW, TRM, LLM	108	107	5	STATUS QUO	
3401-B/C	Thermal Treatment Process Unit	HAZ, LLM TRM	150	91	2,4,6	23-32,37-40	YES
4101	Gas Generation Studies	TRU	62	34	2	17	
4105	Microwave Melting	TRU,LLW, TRM,WM	13	6	4,WMin	23-32	YES
4108-B/C	Solidification Development for Sludges, Salts, and Ash	LLM, TRM	14	4	4	23-32	YES
4111	Incineration Alternatives for Combustible Waste	LLM, TRM	68	38	4,6	23-32,37-40	YES
4118-B	Polymer Solidification Development	LLM (saltcrete)	12	3	4	23-32	YES
4119	Saltcrete and Reprocessed Saltcrete	LLM	12	3	4	23-32	YES
4120	Cyanide Destruction Process	HAZ	11	Saltcrete	4	STATUS QUO	
4200	Mixed-Waste Destruction	LLM, TRM	135	83	2,4,(5)	17-19,23-32	YES

ADS	ACTIVITY TITLE	WASTE TYPE	GENERATED WASTE VOLUME (cubic ft x 1000)	STORED WASTE VOLUME (cubic ft x 1000)	PROBLEM NUMBER	TECHNOLOGY ALTERNATIVE NUMBER	FFCA
4205	Liquid CO2 Cleaning	TRM, LLM HAZ	3	4	1,4	1-16,23-32	YES
4206	Compliance Order Technical Support	ALL	NA		NA	NA	YES
4208	Sort at Source	LLW, TRU	108	NA	4	STATUS QUO	
4211	Environmental Measurement, Instrumentation and Data Acquisition	ALL	NA		7	41	
4215	Controlled Air Incineration	LLW, LLM HAZ	70	77	3,4,6	23-32,37-40	YES
4216-A/B	Robotics Waste Minimization	ALL	NA		WMin	NA	
4217	TPO/TPM Team Support	ALL	NA		NA	NA	
4218	Colorado Center for Environmental Management	NA	NA		NA	NA	
4221	Site Selection Criteria Development	NA	NA		NA	NA	
4222	Analytical Characterization of Mixed Waste	TRM, LLM	NA		5	33-36	YES

ADS	ACTIVITY TITLE	WASTE TYPE	GENERATED WASTE VOLUME (cubic ft x 1000)	STORED WASTE VOLUME (cubic ft x 1000)	PROBLEM NUMBER	TECHNOLOGY ALTERNATIVE NUMBER	FFCA
4225	Industrial Workshops - Technical Integration	ALL	NA		ALL	NA	
4226	Outreach Program	NA	NA		NA	NA	
4227	Operating Support - Environmental Restoration	NA	NA		NA	NA	
4228	Operating Support - Waste Management	NA	NA		NA	NA	
4229	Operating Support - Resumption	NA	NA		NA	NA	
4230	TD Operations and Administration	NA	NA		NA	NA	
4231	TD Total Quality Program	ALL	NA		NA	NA	
4232	Technology Investment Strategy	ALL	NA		ALL	NA	
4234	TD Waste Minimization Program Management	ALL	304	NA	WMin	STATUS QUO	YES
4235	Planning for Waste Integrated Demonstration	LLM, TRM	NA		NA	NA	
4236	Integrated Demonstration Support - Pu in Soils	TRU, LLW (soils)	>1000		Environ-mental Restoration		

ADS	ACTIVITY TITLE	WASTE TYPE	GENERATED WASTE VOLUME (cubic ft x 1000)	STORED WASTE VOLUME (cubic ft x 1000)	PROBLEM NUMBER	TECHNOLOGY ALTERNATIVE NUMBER	FFCA
4237-A/B	Nonchlorinated Solvent Cleaning of Pu	HAZ, LLM, TRM	3	4	1,4,(5)	1-16,23-32	YES
4801	Pneumatic Transfer of Radioactive Material	TRU	UNAVAIL-ABLE		WMin	STATUS QUO	
4802	Ca/Ga/Pu Salt Scrub Development	RES	9	28	3,WMin	20-22	
4803	Casting of Pu Parts in Reusable Shape Metal Molds	TRU, RES	1	1	WMin	STATUS QUO	
4804	Complex Impedance Analysis of Electrorefining	TRU, RES	1	2	3,WMin	20-22	YES
4805	Electroreduction of Pu and Ca Oxides	TRU, RES	4	2	3,WMin	20-22	YES
4806	Electrorefining with Dicesium Hexachloroplutonate	TRU, RES	1	2	3,WMin	20-22	YES
4807	Long-Term Implementation of Direct Oxide Reduction	TRU, RES	4	2	3,WMin	20-22	YES
4808	Ca and Pu Oxide Metering Device	LLW, TRU, RES	<1	<1	3,WMin	STATUS QUO	YES
4809	Oxygen Sparging of Salt Residues	TRU, RES	4	2	3,WMin	20-22	YES
4810	Electrorefining Waste Minimization	TRU, RES	1	2	3,WMin	20-22	YES

ADS	ACTIVITY TITLE	WASTE TYPE	GENERATED WASTE VOLUME (cubic ft x 1000)	STORED WASTE VOLUME (cubic ft x 1000)	PROBLEM NUMBER	TECHNOLOGY ALTERNATIVE NUMBER	FFCA
4811	Direct Oxide Reduction Spent Salt Chlorination	TRU, RES	4	2	3,WMin	20-22	YES
4812	Direct Chloride Reduction of Dicesium Hexachloroplutonate	TRU, RES	1	2	3,WMin	20-22	YES
4813	Short-Term Implementation of Direct Oxide Reduction	TRU, RES	4	2	3,WMin	20-22	YES
4814	Dry Machining of Pu	LLM, TRM	3	4	1,4	1-16,23-32	YES
4815	Aqueous Cleaning of Oralloy Parts	HAZ, LLM, TRM	3	4	1,4	1-16,23-32	YES
4816	Final Aqueous Pu Cleaning (Oil/Solvent Substitution)	TRM, LLM	3	4	1,4	1-16,23-32	YES
4817	Centrifuge for Pu Chip Cleaning	LLM, TRM	3	4	1,4,WMin	1-16,23-32	YES
4818	Chloride Process Development	RES	9	28	3,WMin	20-22	YES
4819	Batch Precipitation	RES	<1	<1	WMin	STATUS QUO	YES
4820	Nitric Acid Dissolution Technology	TRU, RES	4	2	3,WMin	20-22	YES

7.0 QUALITY ASSURANCE

7.1 QUALITY ASSURANCE DEFINITION

Quality assurance consists of the planned and systematic actions necessary to provide adequate confidence that structures, systems, processes, and equipment will perform satisfactorily; that activities are being performed in accordance with prescribed requirements; and that the resulting product meets the defined specifications. It is a shared responsibility of operational management and the Quality Assurance organization. The Quality Assurance organization provides guidance and assistance to operational management and independently reviews results and operating systems to determine whether defined requirements are being met.

7.2 ROCKY FLATS PLANT REQUIREMENTS FOR QUALITY ASSURANCE

The EG&G Rocky Flats QA Program is established in the EG&G Rocky Flats Quality Assurance Manual, which incorporates the requirements of the DOE Quality Assurance Program. The DOE Quality Assurance Program consists of DOE Order 5700.6B (Quality Assurance), DOE/RFO SOP 5700.6B (Quality Assurance), DOE/RFO Quality Assurance Requirements for Rocky Flats Management and Operations, ANSI/ASME NQA-1 (Quality Assurance Program Requirements for Nuclear Facilities) Basic Requirements and Supplements, and DOE/AL QC-1 (Quality Criteria).

Policy

It is the policy of EG&G to implement and maintain an auditable and cost-effective QA Program, founded on the principles of continual improvement, to assure the required level of quality throughout all areas of contract performance, and to guarantee continued customer satisfaction. The Rocky Flats QA Program applies to all projects, programs, and activities managed and conducted by EG&G at Rocky Flats. It is designed to assure the required level of quality and compliance with applicable requirements of government agencies, customers, and EG&G and to strive for continuing improvement in all operations.

Responsibilities

Rocky Flats QA Program responsibilities are described briefly as follows:

- The EG&G Rocky Flats General Manager is responsible for ensuring that a QA Program is implemented and maintained.

- The Assistant General Manager of Quality Assurance coordinates development, implementation, and maintenance of the plant QA Program; provides guidance in the specific application of QA requirements; reviews and

approves QA implementing procedures and plans; interfaces with DOE/RFO on QA issues; and provides independent verification and certification where necessary.

Each plant assistant or associate general manager is responsible for establishing adequate and effective procedures that are compliant with applicable Rocky Flats QA Program requirements.

Documentation

The Rocky Flats Quality Assurance Manual provides the basis for implementation of QA requirements. The requirements of the QA Manual are implemented through development of QA Plans. Rocky Flats organizations implementing the requirements of the QA Manual are responsible for addressing and specifying which QA requirements, or portions thereof, apply to specific activities, items, and services. QA Plans and associated implementing procedures are established with primary emphasis on achieving a high degree of quality and operational success and additional emphasis on safety, health, environmental protection, performance, security, safeguards, and other legal and contractual obligations.

After the overall project requirements are defined, the Program Manager and a Rocky Flats QA representative conduct and document an assessment of the program or project to apply the appropriate level of quality control and verification required to control an item or activity.

A QA Plan is developed as early as possible in the development of a program, project, or activity and identifies the basic elements of the Rocky Flats QA Program requirements that are applicable. The QA Plan includes:

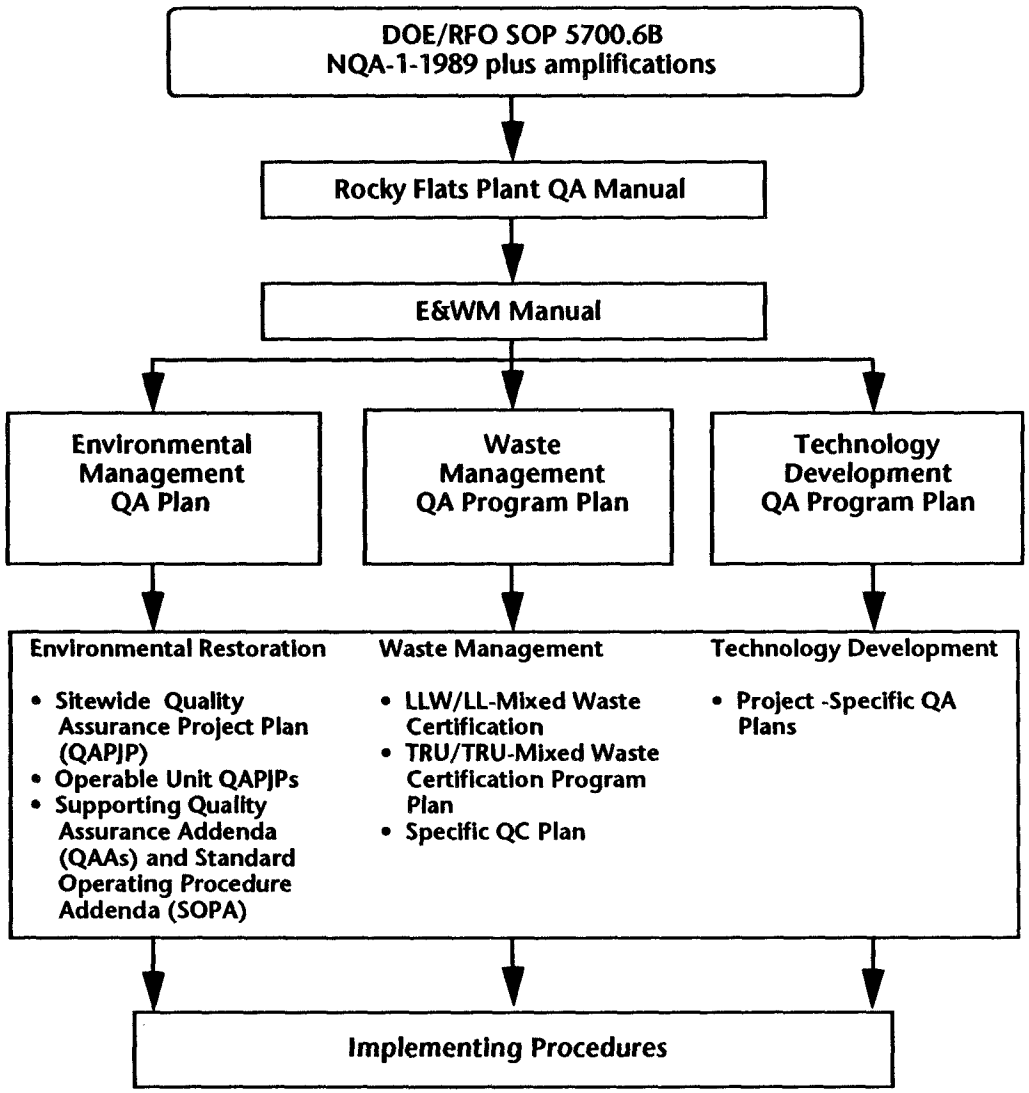
- Evaluation of the activity to determine necessary management controls
- Information regarding organization, responsibilities, procedures, and QA records
- Evaluation of the activity against the 22 basic elements and supplements of the Rocky Flats QA Program requirements
- Identification of required implementation procedures for each applicable element to satisfy the requirements specific to the activity
- Identification of operating procedures and other management controls used to implement and control a given element

The completed QA Plan provides documentation of the program or function's ability to satisfy QA Manual requirements and Rocky Flats Operational Safety Requirements.

7.3 ENVIRONMENTAL AND WASTE MANAGEMENT QUALITY ASSURANCE

The EG&G E&WM organization at Rocky Flats has incorporated or is implementing applicable QA requirements throughout the organization. In addition to the Plant QA requirements, EPA QA requirements and other DOE Orders pertaining to QA are applicable to certain activities under E&WM. The EPA requirements are incorporated into the E&WM QA Program based on guidance included in EPA QAMS/005/80, "Interim Guidelines and Specifications for Quality Assurance Project Plans" and the guidance documents referenced in the IAG. DOE Order 5400.1 establishes environmental protection program requirements for DOE operations and requires that a QA program be established for environmental programs, consistent with DOE Order 5700.6B. (DOE Order 5700.6B sets forth requirements for establishing, implementing, and maintaining plans and actions to assure quality achievement in DOE Programs.)

Documentation of E&WM quality plans and procedures is shown in Figure 7.1. As shown, the E&WM QA Manual addresses sitewide responsibilities and requirements applicable to E&WM directorates. The E&WM QA Manual provides the basis for development of individual departmental QA Program Plans. Waste Programs' Waste Management Quality Assurance division is responsible for providing QA leadership and expertise for Waste Programs and Waste Operations, and Environmental Management and Technology Development are developing separate QA programs. All E&WM departmental QA programs interact to assure consistency among programs.



Environmental & Waste Management Quality Program Proposed Document Hierarchy

Figure 7.1

7.3.1 Environmental Management

Policy

It is the policy of the EG&G Environmental Management department to manage and implement the environmental protection, monitoring, and restoration programs at Rocky Flats in such a manner as to provide the highest quality products, services, and scientific work.

Documentation

EG&G Environmental Management has developed a QA Program Description Document that describes their QA Program and defines the methods and responsibilities for QA policy adherence. The document establishes and presents the framework of requirements that are met in the planning, implementation, documentation, and verification of Environmental Management activities.

Requirements

The Environmental Management QA Program requirements, set forth in the QA Program Description document, provide for:

- QA planning
- Procedural needs for QA
- Identification of required QA records
- Readiness reviews for IAG-required environmental restoration activities (to determine readiness for progress to the next phase)
- Management controls
- Qualification procedures for personnel performing, verifying, or managing activities where quality is a concern
- Designation of the specific activities that require qualified inspection and test personnel
- Establishment of audit personnel qualifications
- Annual management appraisals to assess the adequacy and effectiveness of the QA Program

- Monthly QA Program information tracking and evaluation reporting to the director of the Environmental Management department

Responsibilities

Environmental Management's organizational structure, organizational QA requirements, responsibilities with regard to QA, levels of authority, and lines of communication for activities affecting quality are set forth in the QA Program Description document. The objective of their QA Program is to achieve and maintain quality work performance and to verify quality assurance procedures through direct oversight and audits. Responsibilities are briefly summarized as follows:

- The Environmental Management Department Director directs overall department activities, including establishment and implementation of the departmental QA Program; development of administrative and operating QA implementation procedures; and performance of audits, reviews, and management assessments of the QA Program.

- The Environmental Management Department QA Program Manager directs the QA activities of the Environmental Management Program and ensures the maintenance and monitoring of the departmental QA Program. The QA Program Manager functions independently of the Environmental Management activities being performed and reports directly to the department director.

- Environmental Management Division Managers plan, conduct, and document readiness reviews for planned restoration activities. They assure that personnel performing activities are properly qualified and certified, as necessary, and appoint a division Quality Coordinator.

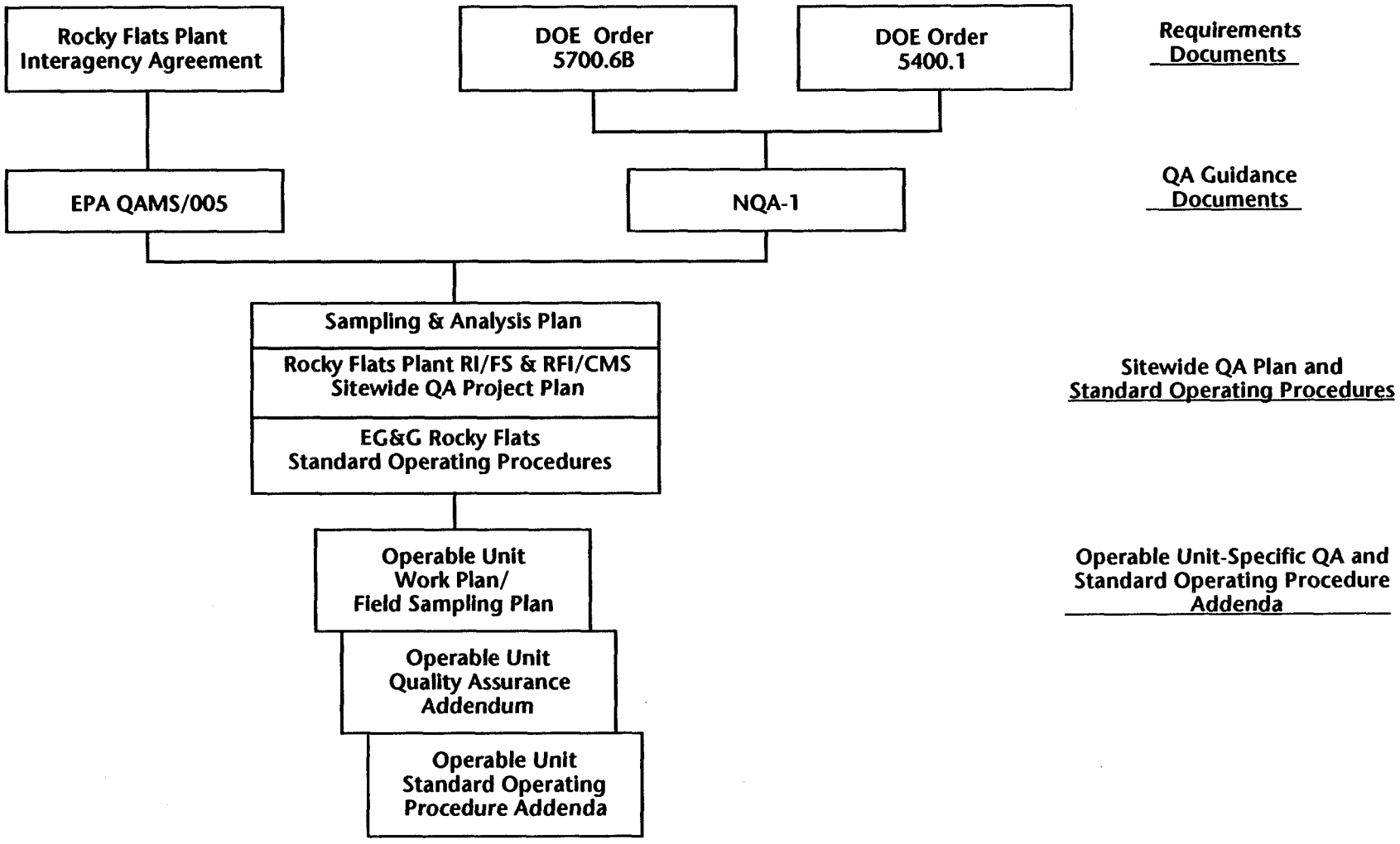
- Environmental Management Division Quality Coordinators are responsible for coordinating Environmental Management QA Program activities within their respective divisions.

IAG QA Documentation

In accordance with the IAG, the Environmental Management department has also developed the Rocky Flats Plant Sitewide Quality Assurance Project Plan for CERCLA Remedial Investigations/Feasibility Studies and RCRA Facility Investigations/Corrective Measures Studies activities. This IAG milestone document identifies the QA requirements and specific measures for implementing these requirements. These requirements are applicable to remedial investigations, treatability studies, and interim and final remedial actions, which are performed as part of the Environmental Restoration Program at Rocky Flats.

The Sitewide QA Project Plan takes into consideration the potential for environmental releases, potential regulatory concerns, DOE Orders, environmental laws, EPA guidance, and public awareness. QA requirements described in the Sitewide QA Project Plan are implemented by DOE, EG&G Rocky Flats, and all subcontractors conducting environmental response activities at Rocky Flats. The plan describes the policy, organization, functional responsibilities, and QA requirements and methods necessary to assure that the quality of data meets the objectives dictated by its intended use.

The QA requirements set forth in the Sitewide QA Project Plan are consistent with the requirements set forth in the Environmental Management's QA Program Description document. The QA requirements and QA document/sampling plan hierarchy for the Environmental Restoration Program are shown in Figure 7.2. The Sitewide QA Project Plan and applicable sitewide standard operating procedures make up the IAG-required Sampling and Analysis Plan for the investigations and study phases of the Environmental Restoration Program.



QA Requirements and QA Document/Sampling Plan Hierarchy for Rocky Flats Plant Environmental Restoration Program

Figure 7.2

Operable unit managers and project managers are responsible for assuring that applicable standard operating procedures and addenda are implemented during the conduct of field activities. Specific organizational structure and responsibilities are developed and presented in an Operable Unit Quality Assurance Addendum created for each operable unit. Each Operable Unit Work Plan/Field Sampling Plan is also accompanied by a QA addendum that outlines the measures taken to meet QA requirements.

7.3.2 Waste Programs and Waste Operations

The EG&G Waste Programs Directorate has established a Waste Management Quality Assurance division to provide QA leadership and expertise to all Waste Programs and Waste Operations departments.

Policy

It is the policy of the Waste Management QA division to meet applicable QA requirements by assisting in establishment and implementation of necessary systems and controls within Waste Programs and Waste Operations that assure compliance with applicable QA requirements.

Documentation

The Waste Management QA division has developed the Waste Management Quality Assurance Program Plan, which provides a comprehensive quality program for Waste Operations and Waste Programs and addresses all Rocky Flats waste. The QA Program Plan and waste-specific management plans are required for certification of radioactive, hazardous, or mixed wastes for offsite transport. Waste-specific plans include the following:

- Low-Level Waste Management Plan
- Transuranic (TRU) Waste Management Plan
- Bin-Scale QA Project Plan
- Supercompactor Process Control Plan

The low-level and TRU waste management plans are sitewide programs that describe the systems and procedures in place to meet the requirements for waste process control and certification. The Low-Level Waste Management Plan incorporates the pondcrete, saltcrete, and sewage sludge process control plans, which address requirements for the specific waste streams.

Requirements/Responsibilities

Responsibilities outlined in the Waste Management QA Program Plan are summarized as follows:

- The Waste Management QA Manager is responsible for directing the QA Program and assuring that QA requirements are met within Waste Programs and Waste Operations.
- The Waste Management Quality Program Development Manager coordinates QA implementation needs, assures that QA documentation is developed, and ensures that QA documents accurately reflect operating systems and are effective in providing necessary controls.
- Waste Operations managers are responsible for operational QA compliance.
- Waste Programs is responsible for supplying quality engineering expertise to prepare project- or activity-specific QA Plans and to assist in their implementation.
- The Waste Management QA department provides QA surveillance to assure continued compliance with QA requirements.
- All management personnel responsible for operations affecting quality are appropriately trained and meet the QA Program Plan qualification requirements.

7.3.3 Technology Development

The Technology Development department is establishing a QA Program to assure compliance with applicable QA policy.

Documentation

The TD QA Program is documented in the Technology Development Total Quality Management Program QA Project Plan. This QA project plan is used by TD personnel on a project-specific basis and provides guidance to project managers for incorporating QA procedures into their project work. It establishes QA requirements and responsibilities for TD personnel and outlines procedures for implementation of QA requirements and policy. The TD Total Quality Management Program requires that each project prepare project-specific QA project plans as part of the project work plan.

Requirements/Responsibilities

The TD Total Quality Management QA Project Plan identifies the QA elements required in the project-specific QA Project Plans. Project activities conducted within TD proceed through several phases in the course of project development. Each phase of project development incorporates QA policy requirements into the project. Data quality objectives are developed specifically for the project during the early stages of project planning.

For a given project, qualitative and quantitative project data quality objectives, project scope, and project description are discussed in the initial project development plan. The projects description defines the project's QA objectives in terms of the project requirements. The project's methods of sampling, sampling preparation, and analysis are selected in order to meet the project's QA objectives. The QA objectives establish the minimum quality level of data required to draw valid conclusions regarding the objectives of the test program and to support specific decisions or regulatory actions. The initial project development plan also identifies the key QA/QC personnel associated with the project and specifies the procedures for project communication, including procedures for monitoring subcontractors.

A QA project plan is required for each phase that the project enters after it is approved and funding is made available. The experimental phase necessitates an experimental QA project plan, which addresses applicable QA needs, including responsibilities, data quality objectives, performance verification, and internal and external requirements. Upon completion of the experimental phase, which includes laboratory- and/or bench-scale testing and the subsequent experimental results report, the project may enter the demonstration phase, where a demonstration QA project plan is required.

The pilot-scale test demonstration QA project plan is similar to the experimental QA project plan, but it is more detailed because of the increased level of overall project requirements at this stage. The plan includes the use of checklists to ensure project readiness for start-up, a schedule of all planned performance evaluations and regulatory audits, the personnel responsible for such audits, and a schedule of any inter-laboratory performance evaluation studies.

Full-scale design and construction is the final phase that a project may enter. The applicable QA requirements are incorporated into the project as in other phases. Full-scale project QA project plan approval is required prior to construction.

8.0 ASSUMPTIONS

The assumptions that Rocky Flats is using in FY92 as a basis for developing the FY92 SSP and the FY94-FY98 FYP are discussed in this section. Although these assumptions are in many cases not specific to FY92, they are listed herein because they form the basis of an integrated planning approach that extends beyond FY92. It should be noted that these assumptions are established as a guide for the Rocky Flats planning process. Actual funding limitations and changes in regulations, management, and priorities will affect work actually accomplished in any given year.

8.1 ASSUMPTIONS BASED ON INSTITUTIONAL IMPACTS

Assumptions in this category address continuity in governments, public interest groups, and other organizations that may impact Environmental Restoration and Waste Management programs at Rocky Flats. Because the structure, policies, and goals of these institutions have changed rapidly over the last few years, it is likely that further changes will occur in the future. In order to provide a stable context for preparation of this plan, the assumptions presented below (categorized by institution potentially impacted) have been made.

Federal Government

It is assumed that Federal environmental and military policies (Congress, EPA, DOT, Nuclear Regulatory Commission, and DOD) and national priorities (Executive Branch) continue without major changes for the FYP planning horizon.

U.S. Department of Energy

Regarding DOE policies, it is assumed that (1) there is consensus management (negotiated agreements between states, federal agencies, and the public); (2) commitments made to-date will be honored; and (3) DOE/EM priorities will have higher priority than work required by DOE/DP. In addition, it is assumed that DOE structure does not significantly change from the FY91 structure.

Environmental and Waste Management

It is assumed that the SSP, FYP, and RDDT&E plan will be followed.

Mission Offices

It is assumed that interfaces between DOE/EM, DOE/DP, and the DOE Rocky Flats Office remain constant.

With regard to Defense Programs, it is assumed that the primary mission of Rocky Flats, relative to nuclear weapons production, will continue. Additionally, it is assumed that there will be no major change of mission. Modernization or relocation plans are not taken into consideration; therefore, upgrades and long-term maintenance of facilities are planned. When such modernization or relocation plans are officially announced, the SSP, FYP, etc., will be modified accordingly.

Third Parties

It is assumed that non-governmental groups will not significantly change the existing waste management and remediation agreements and goals between Rocky Flats and federal or state governmental agencies.

State/Municipalities

It is assumed that there will be no major reorganizations or restructuring of state or municipal agencies that would require revision of Rocky Flats plans and reporting standards. It is also assumed that changes in state or municipal administration will not result in significant reinterpretation of clauses within existing compliance agreements.

8.2 ASSUMPTIONS BASED ON REGULATORY COMPLIANCE DRIVERS

The existing network of laws and regulations was formulated principally on the basis of controlling the environmental impacts of industrial and municipal plants. DOE facilities are unique and often very much unlike the intended targets of the Resource Conservation and Recovery Act (RCRA) or the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA); consequently, a set of consent agreements, DOE Orders, and legal interpretations has evolved in an attempt to reach consensus for regulation of DOE facilities. Future FYPs and SSPs will incorporate EM activities necessary to comply with new regulatory requirements as the impacts become known. To provide a stable context for preparing this plan and the FYP, the assumptions presented below (categorized according to regulatory driver) have been made.

General

It is assumed that current laws, orders, regulations, agreements, and plant policies will continue as stated and Rocky Flats will remain in compliance. Rocky Flats assumes that the highest priority agreements are (1) Residue Compliance Agreement (RCA); (2) Federal Facilities Compliance Agreements (LDR FFCA/NPDES FFCA); (3) Agreement in Principle; and (4) Interagency Agreement (IAG). Other agreements exist (TRU waste limit agreement, permit conditions, new draft Part B application for low-level mixed waste, etc.), but it is assumed that the bulk of Rocky Flats commitments will be generated from these four major agreements.

In the ER area, it is assumed that the IAG takes precedence if any scheduling discrepancies exist between the agreements.

Federal

Regarding Federal regulations, the following assumptions are made:

1. Corrective Activities will be completed within two years.

2. ER will complete all site remediations by FY2010, excluding RCRA performance monitoring.

3. NEPA will be implemented in accordance with Senior Executive Notice (SEN) 15-90.

4. RCRA interim status will be granted to all new waste treatment units as required to meet DOE/EM schedules.

5. The IAG schedule, which shows NEPA activities integrated with existing Rocky Flats schedules, will be met. The IAG allows 62 working days for DOE to perform its review of environmental assessments.

6. RCRA permits in the demonstration phase are not contingent upon Part B or public notice/hearing.

7. Rocky Flats will obtain a new facility-wide air permit under the new Clean Air Act.

State

It is assumed that all state compliance agreement requirements will be met on schedule. It is also assumed that the IAG schedules, which include tasks for regulatory reviews ranging from 21 to 62 working days, will be met.

Following CDH's review of APENs, it is assumed that air permits will be obtained and that permit requirements will be met.

Third Parties

The IAG schedule, which contains time for public review and comment periods of 41 working days, will be met. (Past and current performance has shown that public review and comment periods are consistent with this duration).

Site

It is assumed that future onsite audit teams will generate new compliance requirements.

8.3 ASSUMPTIONS BASED ON PROJECT REQUIREMENTS

To provide a long-term basis for management planning of project schedules, labor, and activities required to achieve regulatory compliance, numerous site-specific assumptions have been made by the Rocky Flats staff. The assumptions presented below (categorized by project requirement) are made to set all the boundary conditions necessary for management to estimate quantitative resource requirements for project implementation.

Resources

It is assumed that planned funding requirements that are consistent with established priorities will be met. It is also assumed that human resources (EG&G, federal, state, contractor) with adequate training will be available or that training programs will increase availability of trained personnel. In addition, it is assumed that adequate internal support within Rocky Flats (e.g., engineering, cost estimating, subcontracting) will be available for environmental restoration and waste management activities.

Budget Process

It is assumed that full funding to achieve compliance with existing signed agreements will become available and that personnel/resources will be available to accomplish the budgeted program (e.g., allocated funds will be spent).

Project Baselines

With regard to project baselines, the following assumptions are made:

1. The project schedule and associated budgets have been constructed on the basis of the most current Scope of Work. As unforeseen circumstances occur, the Scope of Work will not be significantly modified.

2. There will be no significant change in the level of documentation required to support project accomplishments.

3. Environmental Restoration investigations will not yield any findings that would significantly alter work estimates. This includes the assumptions that these investigations will not proceed beyond Phase III and that schedules can be met.

4. Residues will be managed according to the RCA.

5. Waste operations are necessary, ongoing functions and will continue without regard to the status of plant operations (e.g., whether or not Rocky Flats resumes plutonium operations).

6. Projects will need to be re-evaluated on a case-by-case basis for impacts of changes in missions, laws, regulations, lawsuits, etc.

External Support

With regard to external support, the following assumptions are made:

1. There will be no Rocky Flats shutdown due to inability to store or dispose radioactive and mixed wastes. A waste management alternative will be identified.

2. DOE interstate or regional treatment, storage, and disposal systems will be available for Rocky Flats waste.

3. Shipment of waste to WIPP as part of the five-year test phase will begin in early FY92.

4. TRUPACT II, the transportation package that will be used to ship waste to WIPP, will be certified to transport all TRU wastes at Rocky Flats.

5. The Nevada Test Site will receive low-level and low-level mixed waste from Rocky Flats, or alternative disposal sites will be found.

6. Other DOE weapons production sites may store some Rocky Flats mixed waste to ensure that Rocky Flats does not reach its permitted storage limit. However, the details of shipping waste to other sites and the acceptability of this option to management at the other sites have not been determined.

Technical Support

With regard to technical support, the following assumptions are made:

1. Waste generated from environmental restoration activities will be treatable (e.g., treatment will be available when the need arises in order to certify wastes for disposal).

2. All current treatment research and development needs have been identified and high-priority projects will eventually be funded.

3. Laboratory capabilities for analysis of TRU waste stream and residue samples will be available.

4. Methods for representative sampling of heterogeneous waste will be developed.

9.0 AGREEMENTS

One of the goals for Rocky Flats is compliance with all applicable environmental regulations and conditions set by permits and agreements. Many of the activities in the FYP are specifically needed to achieve compliance with permit requirements and agreement terms. The agreements that affect activities at Rocky Flats are listed below.

9.1 AGREEMENT IN PRINCIPLE (AIP)

DOE and CDH entered into the AIP on June 28, 1989. In this agreement, DOE committed to an expanded environmental monitoring program at Rocky Flats, an acceleration of clean-up activities at some contaminated sites, several initiatives for achieving a more comprehensive environmental management system at Rocky Flats, and allocation of additional funds to the State of Colorado to administer programs at Rocky Flats. The AIP was signed after the original ADSs were prepared for inclusion in the DOE/Headquarters FYP.

9.2 FEDERAL FACILITY COMPLIANCE AGREEMENT (FFCA)

On September 19, 1989, DOE, EPA, and the State of Colorado signed an FFCA regarding LDRs for mixed waste at Rocky Flats. The FFCA outlines steps to be taken to achieve compliance with the LDRs. Compliance with the FFCA requires activities in three areas:

1. Storage - On October 19, 1989, Rocky Flats submitted a Storage Report that included descriptions and quantities of LDR-mixed wastes at Rocky Flats, locations and methods of storage, and information regarding releases and generation rates.

   On November 17, 1989, Rocky Flats submitted an inventory identifying all areas where mixed wastes were stored.

   On March 16, 1990, Rocky Flats submitted an LDR Determination Report identifying whether or not the radioactive wastes not identified in the Storage Report were prohibited wastes covered by the FFCA.

   By the end of September 1990, Rocky Flats had submitted a comprehensive draft Waste Characterization Report of all waste stored at Rocky Flats and all waste streams generated at Rocky Flats.

2. Treatment - On December 22, 1989, Rocky Flats submitted Treatment Report #1, which identified treatment and disposal technologies needed to manage LDR-mixed wastes being generated, the availability of existing treatment technologies, and alternative technologies currently under development.

   On May 17, 1990, Treatment Report #2, which addressed wastes not covered in the October 1989 Storage Report, was submitted.

   Rocky Flats submitted Treatment Plans #1 and #2 on March 28, 1990, and August 15, 1990, respectively, as follow-up to the Treatment Reports. These plans included milestones and schedules for development and implementation of treatment technologies.

3. Minimization - On December 18, 1989, Rocky Flats submitted a Comprehensive Waste Minimization Report.

   An Addendum to the Waste Minimization Report, based on the Storage Report and Inventory Report, was submitted on June 15, 1990.

   The FY91 Waste Minimization Program Plan was submitted on March 3, 1991.

   Also in FY91, a computerized data management system for application in waste minimization activities was completed and the Annual Waste Reduction Report was prepared for submittal on April 15, 1991.

Because FFCA renegotiations were not completed, the FFCA was extended on March 8, 1991, until May 10, 1991. On May 10, 1991, EPA and DOE agreed to a two year extension of the FFCA.

9.3 SETTLEMENT AGREEMENT AND COMPLIANCE ORDER ON CONSENT #89-10-30-01 (RCA)

The Settlement Agreement and Compliance Order on Consent #89-10-30-01, commonly referred to as the RCA, documents the understanding between DOE and CDH regarding alleged violations of 6 CCR 1007-3 of the Colorado Hazardous Waste Regulations that resulted from storage of residues containing hazardous waste. The overall intent of the RCA is to (1) identify those residues contaminated with hazardous constituents and/or possessing hazardous characteristics that may be subject to RCRA regulation and (2) set forth the activities necessary to bring treatment and storage of such residues into compliance with RCRA regulations.

Renegotiations regarding the RCA, which was entered into on November 3, 1989, are under way in order to settle issues stated in an August 9, 1989, Notice of Violation pertaining to management of hazardous residues. Renegotiations are necessary as a result of an April 1990 court ruling that states that residues containing hazardous waste are mixed waste and subject to RCRA regulations, regardless of economic recovery potential. Renegotiations are also necessary in order to set new time frames and milestones for further RCRA compliance activities associated with mixed residues.

DOE has complied with the following RCA requirements:

- On December 15, 1989, DOE submitted a residue inventory report that included location of storage, type of storage, quantity, and item description. DOE also provided a draft compliance framework for residue classification on this date.

- On December 30, 1989, and every 60 days thereafter, DOE submits a progress report to CDH.

- On January 31, 1990, DOE submitted a Residue Classification Plan that detailed methods, schedules for implementation, and procedures to be used in determining whether residues are solid wastes and, if so, whether they are recyclable materials. Implementation, in accordance with the approved schedule, was required to begin within 10 days of plan approval.

- On February 1, 1990, DOE submitted to CDH for review descriptions of all processes used at Rocky Flats to process or recycle residues.

- On March 2, 1990, DOE submitted a Compliance Evaluation Report and Interim Compliance Plan that described the physical status of each residue storage location compared to the storage requirements and proposed corrective actions.

- On March 30, 1990, DOE submitted a Residue Characterization Plan to CDH.

- On June 1, 1990, DOE submitted a Residue Classification Report to CDH for review and approval.

- On September 28, 1990, DOE submitted a Residue Compliance Plan to CDH.

On September 28, 1990, the Residue Compliance Plan became available for public comment through December 3, 1990. Finalization of the RCA will include consideration of comments received from the public. EG&G Rocky Flats is currently preparing the RCRA Part B permit application for mixed residue storage and treatment at Rocky Flats.

9.4 INTERAGENCY AGREEMENT (IAG)

The IAG for environmental restoration activities at Rocky Flats was signed on January 22, 1991, by DOE, EPA, and CDH. Officially titled as a Federal Facility Agreement and Compliance Order, the agreement clarifies responsibilities and authorities of the three agencies, spells out procedures to be followed, and sets timelines for completion of various activities for study and clean-up of past contamination at Rocky Flats. The agreement outlines each agency's role in the study and clean-up process. It also provides mechanisms for resolving issues that may arise among the participants during clean-up activities. The IAG and FYP are the principal documents guiding clean-up efforts at Rocky Flats.

The draft IAG was issued for public comment in December 1989 and was then submitted for official approval in August 1990, with changes reflecting comments received from the public. The final IAG is substantially the same as the draft IAG. The most visible modifications were the reprioritization of the Rocky Flats operable units and changes in the milestone schedules for the operable units. The most significant change was in response to public comments requesting higher priority for offsite soil and reservoir contamination areas. These offsite areas are now designated as Operable Unit 3 instead of Operable Unit 10.

The operable unit reprioritization necessitated adjustments in the timelines associated with the operable units to reflect more realistic schedules for completion of the various studies required. The IAG requires that DOE notify the public of any schedule changes to those set forth in the final IAG. The final IAG also stipulates that various additional measures be taken for improved public involvement and directs DOE to address these public involvement commitments in the Community Relations Plan. The Community Relations Plan was drafted and released for public comment in March 1991.

Future revisions of the FYP will be consistent with the final IAG. The specific purposes of the IAG are to:

- Identify IRAs and IMs, if any, that are appropriate at Rocky Flats sites prior to implementation of final remedial actions for the sites.
- Establish requirements for performing an RFI/RI and for performing an FS/CMS for each operable unit at Rocky Flats in accordance with CERCLA, RCRA, and CHWA.
- Identify the nature, objective, and schedule of response actions to be taken at Rocky Flats sites.
- Assure compliance with federal and state hazardous waste laws and regulations for matters covered by the IAG.

9.5 NPDES FEDERAL FACILITY COMPLIANCE AGREEMENT (NPDES FFCA)

The final NPDES FFCA was signed by DOE/RFO on March 19, 1991, and by EPA on March 25, 1991. The draft agreement between DOE and EPA was negotiated in 1989/90 to provide a high level of protection for waters discharged from Rocky Flats. This agreement outlines the steps to be taken to assure compliance with the Clean Water Act and with environmental laws under Executive Order 12088. Under the direction of DOE/RFO, EG&G Rocky Flats began implementation of the draft agreement in FY90. The final NPDES FFCA includes the following requirements:

- Effluent requirements and limitations were adjusted, including: change of Pond B-3 as a designated point of discharge to the Sewage Treatment Plant (STP) for all parameters except residual chlorine and nitrates, setting of the chromium concentration limit at 50 micrograms per liter, and application of best management practices to spray irrigation operations.

- Water monitoring requirements were enhanced beyond those prescribed in the site's NPDES permit. The monitoring frequency for carbonaceous biological oxygen demand (CBOD5), total suspended solids, and fecal coliform bacteria was set at no less than twice per week. The effluent from the STP will be monitored for volatile organic compounds on a monthly basis. In addition to monitoring at the STP, authorized discharges from Pond B-3 will be monitored for CBOD5, biological oxygen demand (BOD5), total suspended solids, total residual chlorine, and nitrate.

- All effluent discharges from the STP and Ponds A-4, B-5, and C-2 are to be monitored for acute toxicity.

- Preparation of a compliance plan for maintaining compliance with the site's NPDES permit and the FFCA itself. The plan, which was submitted in July 1990, included the following:

  - A complete diagnostic evaluation of the STP relative to past noncompliance issues.

  - Identification of remedies for issues covered in the STP evaluation, including upgrades to STP instrumentation, upgrades to STP sludge drying beds, and increased storage capacity for the STP. These upgrades will require $8.7 million in funding.

  - A schedule for implementing the required actions.

  - Periodic progress reports.

- A groundwater monitoring plan for the STP sludge drying beds and a plan implementation schedule were submitted to EPA in July 1990.

- A plan and implementation schedule addressing findings of the Report of the Chromic Acid Incident Investigation at Rocky Flats were submitted to EPA in mid-November 1990. The actions in response to the findings range from minor administrative changes to major capital projects, all of which impact many organizations and facilities at Rocky Flats. It is estimated that the cost of these corrective actions may exceed $40 million. Execution of this plan will require substantial resources and coordination throughout Rocky Flats. After EPA completes its review of the report, EPA and DOE/RFO will meet to determine the final scope of the required response.

- Reporting requirements were adjusted on the basis of revised monitoring criteria.

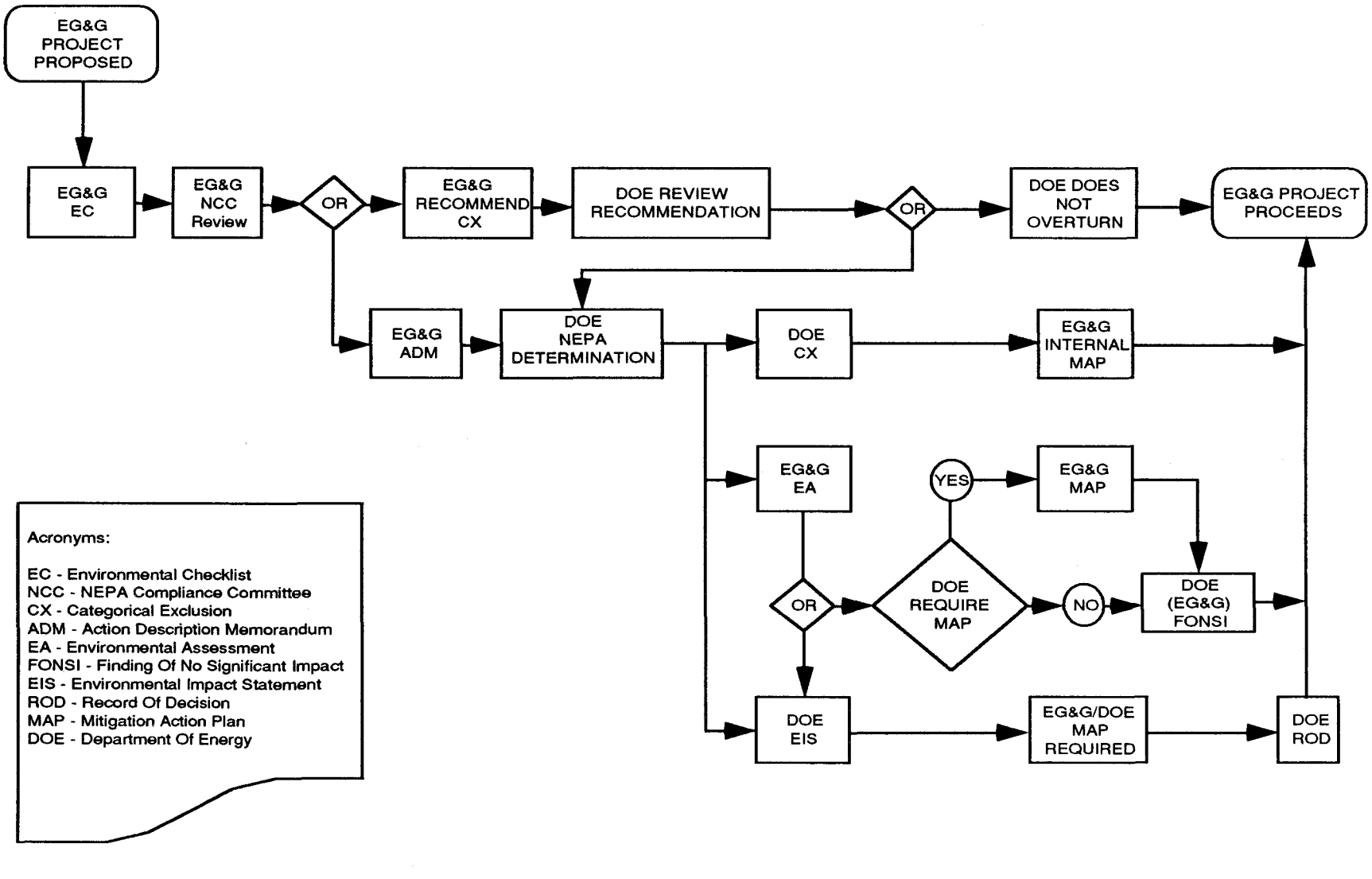
Progress reports indicating status relative to the compliance plans are required on a quarterly basis.

10.0 NATIONAL ENVIRONMENTAL POLICY ACT

NEPA is the nation's most comprehensive legislative and public policy statement on protection of the environment. Federal regulations administered by the Council on Environmental Quality require submittal of NEPA documentation for major federal actions or those actions with potential for significant effects on the quality of the human environment. Levels of NEPA documentation include categorical exclusions (CX), environmental assessments (EAs), and environmental impact statements (EISs).

The Rocky Flats Plant established a NEPA Compliance Committee in February 1989 to provide integrated review, guidance, and oversight for plantwide activities. The NEPA Compliance Committee created the Rocky Flats Plant Environmental Checklist (EC), which is suggested for all proposed actions. The EC provides an initial screening and review of construction and engineering projects to determine whether submittal of an action description memorandum (ADM) is recommended or whether the action fits one of the department's categorical exclusions. ADMs are submitted to DOE for a determination of the level of NEPA documentation required (EA or EIS).

The principal forms of NEPA documentation (categorical exclusion, environmental assessment, and environmental impact statements) are discussed in further detail below. A flow chart illustrating the NEPA determination process is provided in Figure 10.1.



National Environmental Policy Act
Documentation Determination Process
Figure 10.1

10.1 CATEGORICAL EXCLUSIONS

A CX is used to define categories of actions that do not individually or cumulatively have a significant effect on the quality of the human environment. If a proposed action falls under one of these categories, it is exempt from requirements to prepare an EA or an EIS. The list of CXs is defined and approved by DOE. The NEPA guidelines (the rulemaking policy) are periodically updated to include new CXs as they are approved.

10.2 ENVIRONMENTAL ASSESSMENTS

An EA is an analysis used to determine whether a proposed project will significantly affect the environment and thus require preparation of a more detailed EIS. If an EA indicates that there are no significant impacts, DOE will prepare a FONSI, which is a summary of the reasons that the proposed action does not impact the environment. Some of the key projects for which EAs are currently being prepared are:

- Residue Drum Storage Facility
- New Sanitary Landfill
- Solar Evaporation Ponds; Dewatering and Sludge Removal
- Liquid Waste Treatment Facility Upgrades
- Process Waste Transfer System

10.3 ENVIRONMENTAL IMPACT STATEMENTS

An EIS is a public document required of federal agencies for major projects significantly affecting the environment. It is used as a decision-making tool and examines alternatives and the positive and negative effects of the proposed action. EISs relating to Rocky Flats, which are currently in progress, are discussed below.

10.3.1 Rocky Flats Plant Sitewide Environmental Impact Statement

DOE has published its intent to prepare a SWEIS on the overall operations at Rocky Flats Plant in the March 13, 1991, Federal Register. The SWEIS will identify and assess potential impacts and present a full evaluation of the cumulative environmental impacts of current operations and future actions, including proposed near-term environmental restoration activities at Rocky Flats.

This SWEIS is being prepared in response to findings from DOE's internal environmental compliance assessment (Tiger Team Audit), which indicated the need to update the existing 1980 Rocky Flats Plant EIS, and also to further the purpose of NEPA as defined in Secretary Watkins' memo dated February 5, 1990. The SWEIS will also lay the groundwork for the proposed environmental restoration EAs defined within the IAG.

Public scoping meetings for the SWEIS were held in April 1991. These sessions provided the public and other government agencies with an opportunity to express to DOE concerns that should be addressed in the SWEIS. The scoping comments are being evaluated to determine the extent of analysis needed for specific topics, possible new sources of information, and ultimately the content of the SWEIS.

The following issues have been identified for analysis in the SWEIS, subject to consideration of comments received in response to public scoping:

- Water Resources and Water Quality - the qualitative and quantitative effects of Rocky Flats operations on water resources in the region
- Air Quality - radiological and nonradiological emissions to the air
- Public and Occupational Safety and Health - the cumulative radiological and nonradiological impacts on workers and the public from routine operations and potential accidents
- Biological Resources - the disturbance or destruction of habitat, including potential effects on threatened or endangered species
- Waste Management - the environmental effects of management of solid and liquid wastes, including radioactive, hazardous, mixed transuranic, and low-level wastes generated by restoration activities
- Environmental Management - cumulative impacts from environmental restoration efforts to correct problems created by past releases to the environment, including groundwater and soil contamination
- Socioeconomics - the effects of construction and operations on the local community
- Cultural Resources - the potential effects on historical, archaeological, scientific, or culturally important sites
- Transportation - impacts from onsite and offsite transportation of materials, equipment, products, and wastes

- Decontamination and Decommissioning - the impacts of decontaminating and decommissioning Rocky Flats facilities

An implementation plan will be prepared for the SWEIS, including a draft outline and a general schedule for development of the SWEIS. DOE expects to complete the implementation plan for the SWEIS in late 1991.

After the draft SWEIS is issued, another public comment period will be held. DOE will consider the resulting comments in preparation for the final SWEIS. DOE will announce its decision concerning the proposed action and its alternatives in a Record of Decision (ROD), which will be available to the public.

10.3.2 Environmental and Waste Management Programmatic Environmental Impact Statement

In October 1990, DOE published its intent to conduct a Programmatic Environmental Impact Statement (PEIS) for activities performed under the Office of Environmental Restoration and Waste Management. The goal of this program is to mitigate potential risks to human health and the environment posed by wastes under DOE jurisdiction.

Environmental restoration activities covered by this PEIS include assessment and physical cleanup of contamination at DOE installations and other properties as well as decontamination and decommissioning or dismantling of surplus DOE facilities. DOE waste management operations to be considered in the PEIS include treatment, storage, and disposal of waste. The PEIS will review the waste generated through ongoing nuclear energy, energy research, defense, and environmental restoration activities.

Historically, DOE reviewed environmental restoration and waste management operations on a site-by-site basis, but this practice has led to differing approaches to clean-up and waste management among DOE sites. With regard to environmental restoration, DOE proposes to approach decontamination and decommissioning activities throughout all the DOE facilities in an integrated, systematic fashion. The waste management section of the PEIS will provide an analysis of the source, amount, type, and source location for wastes generated within the system over time. This information will be analyzed from a program-wide perspective to determine the most appropriate management alternative. Potential alternatives include treatment, storage, and disposal of the different types of waste in central, regional, or local facilities. Transportation of waste and the potential associated impacts will also be evaluated.

If the PEIS indicates that an integrated system is not feasible, DOE would continue to conduct environmental restoration activities and waste operations as discrete, site-specific actions. If site requirements were to dictate the need for offsite or new facilities, management decisions would be made on a project-specific basis.

10.3.3 Reconfiguration Programmatic Environmental Impact Statement

In February 1991, DOE announced its proposal to reconfigure its nuclear weapons complex to be smaller, less diverse, and less expensive to operate. As part of the reconfiguration, DOE proposed the relocation of the nuclear weapons functions now located at Rocky Flats. This proposal will be covered in a DOE programmatic EIS called the Reconfiguration Programmatic EIS.

This EIS will analyze the environmental consequences of alternative long-term reconfiguration strategies for the DOE nuclear weapons complex, envisioned to be in place early in the 21st century, and weigh these against the consequences of maintaining the existing configuration. DOE does not consider it feasible to shut down, dismantle, and relocate these functions in the near term (before the year 2000) because a relocation site must be selected, technology approved, and facilities designed, constructed, and tested before the existing facilities could be shut down.

The public scoping meeting for the Reconfiguration Programmatic EIS was held in April 1991.

10.4 MITIGATION ACTION PLAN

A Mitigation Action Plan (MAP) describes the method by which the NEPA determination will be implemented through the course of a project. It includes the actual planning document and outlines monitoring activities that will be performed to verify proper and effective execution of the plan. MAP monitoring activities accomplish three purposes:

1. Implementation monitoring ensures that techniques identified in the EA or EIS to mitigate environmental impacts are actually used during the course of the project. This type of monitoring verifies that mitigation was implemented as designed and is in accordance with standards and guidelines.

2. Effectiveness monitoring evaluates the mitigation process to verify that the mitigation action has met its objectives and has had no additional or unexpected impacts on the environment that were not previously analyzed in the assessment documentation.

3. Validation monitoring continues after the project has been completed to verify that no problems have arisen during the course of the project. The validation process continues until DOE is confident that all results of the project are environmentally safe.

EG&G initiates a MAP as an internal document for all projects in which NEPA is applicable. The MAP becomes a public document only upon request by DOE. DOE will request a MAP on high-priority projects, regardless of whether they impact the environment.

APPENDIX A

FISCAL YEAR 1992 FUNDING SUMMARY

FY92 Funding Summary
($1,000)

MEDIA/ DATA SHEET#	TITLE	FY92 FUNDS (Thousands)	
Corrective Activities			
Air			
83	Upgrade Radioactive Stack Sampling	466	
109	Survey and Identify Existing NESHAPS Emissions	1,220	
	Subtotal Corrective Activities		**1,686**
Environmental Restoration			
CERCLA Assessment			
1001A	Operable Unit 1 881 Hillside	2,636	
1002A	Operable Unit 2 903 Pad, Mound, & E. Trenches	6,600	
1011	Operable Unit 3 Offsite Areas	801	
CERCLA Remediation			
1001B	Operable Unit 1 881 Hillside	2,025	
1002B	Operable Unit 2 903 Pad, Mound, & E. Trenches	2,010	
RCRA Assessment			
1258A	Operable Unit 4 Solar Ponds	1,000	
RCRA Remediation			
1258B	Operable Unit 4 Solar Ponds	24,228	
RCRA/CERCLA			
1012	Sitewide Programs Assessment	7,200	
1233	ER Program Management	3,500	
	Subtotal Environmental Restoration		**50,000**

Waste Management

Compliance			
3294A	Payment to the State of Colorado & Local Communities	2,305	
COO			
81	Compliance Program Management	8,087	
90	Waste & Environmental Data Management	2,032	
3177	Waste Management Program Support	27,706	
3293	Program Support for Compliance Activities	3,986	
3294C	Offsite Water Management (Option B)	5,000	
Disposal			
3153	New Sanitary Landfill	1,244	
3157	Offsite Transport of Waste	788	
Minimization			
3242	Waste Minimization - Program Administration	1,406	
Storage			
3136	Building 569 Addition	400	
3137	Building 776 Upgrade, Phase I	100	
3150	LLW-Mixed Storage Facility	930	
3168	Waste Storage, Non-PSZ	15,534	
3260	Waste Certification	2,480	
Treatment			
3135	Building 374 Liquid Waste Treatment Upgrades	588	
3148	Liquid Waste Operations, Building 374	7,550	
3149	Liquid Waste Operations, Building 774	6,957	
3169	Solid Waste Operations, PSZ	8,869	
3288	Sewage Treatment Plant Upgrade Permit Requirements	7,419	
3408	Baler Upgrade, Building 889	100	
	Subtotal Waste Management		**103,481**
	Total Five-Year Plan		**155,167**

Base Environmental Programs

Air		
5003	Continuous Emissions Monitoring	430
5005	Meteorological Monitoring	2,437
5007	Effluent Air Monitoring (Radioactive & Non-Radioactive)	1,048
5008	Non-Radiological Air Monitoring	182
5011	Air Modeling	189
5012	CAER Operational/Administrative	2,073
5013	Environmental Reporting	1,403
5014	Clean Air Act Implementation/Compliance	1,362
5016	Clean Air Program Upgrades	1,222
5017	Radiological Ambient Air Monitoring	1,090
5026	EMAD Operational/Administrative	4,514
5027	Clean Air Act Permitting	671
5075	Air Emissions Sampling	338
5083	Upgrade Radioactive Stack Sampling	670
5108	Prepare Air Pollution Emission Notices (APENs)	618
5111	Dispersion Modeling of Plant Offsite Impacts	344
Auditing		
5234	ER Department Operations and Administration	3,124
5235	Rocky Flats Environmental Data Base System	3,451
Permitting		
5028	NEPA Administration and Operations	3,462
5029	NEPA Baseline Studies	2,440
5041	NEPA Support - Water Management	2,412
5089	Sitewide EIS Activities	5,814
Solid		
5002	Soil Monitoring	3,572
5043	SWMU Management	216
Water		
5004	Water Monitoring and Control Enhancements	657
5015	Environmental Engineering Program	805
5018	Clean Water Act Division Administration	1,882
5019	Surface Water Monitoring and Program Upgrades	23,257
5023	Hydrogeochemical Characterization	14,740
5112	Effluent Treatment	10,232
5120	Dam Reinforcement at Ponds A-4, B-5, and C-2	2,989
5121	Water Quality Characterization and Assurance	2,184
5288	Sewage Treatment Plant Upgrade Support	606
	Subtotal Base Environmental	**100,434**

Waste Management Base Programs

Operations			
5048	NDA Operations - Inspection	8,536	
5049	Present Sewage Treatment Operations	2,415	
5050	Passive/Active Neutron Crate Counter, Bldg. 569	590	
5051	Passive/Active Neutron Drum Counter, Bldg. 771	1,000	
5052	Passive/Active Neutron Drum Counter, Bldg. 390	1,000	
5055	Waste Stream Characterization	3,188	
5056	Base Waste Quality Support	3,387	
5057	Landfill Operations	2,391	
5059	NDA Operations - Assay & Surveillance	11,522	
5061	Waste Characterization - Non-PSZ	3,818	
5064	Residue Drum Storage Facility	7,700	
5131	Passive/Active Neutron Drum Counter	900	
5163	Offsite Water Management (Option B)	5,000	
5178	Waste System Evaporator, Building 374	4,800	
5292	Waste Characterization - PSZ	3,127	
Certification			
5260	Base Waste Certification	4,233	
Minimization			
5030	TRU/TRU-Mixed Waste and Residue Minimization	1,546	
5031	Low-Level/Low-Level Mixed Waste Minimization	954	
5032	Hazardous Waste Minimization	521	
5033	Process Waste Water Minimization	375	
5034	Solid (Sanitary) Waste Minimization	540	
5035	Halogenated Solvent Elimination	1,077	
Permitting			
5058	Residue Permitting	690	
5259	Storage Tank Management	1,045	
	Subtotal Base Waste Management		**70,355**
	Total Base		**170,789**

Technology Development - Office of Technology Development

3401B	Thermal Treatment Process Unit	1,550	
4108B	Solidification Development for Sludges, Salts	379	
4111	Incineration Alternatives for Combustible Waste	857	
4215	Controlled Air Incinerator (Pyro. Dest. Org.)	50	
4216A	Robotics Waste Minimization	300	
4218	Colorado Center For Environmental Management	50	

4221	Site Selection Criteria Development	10
4222	Analytical Characterization of Mixed Waste	500
4225	Industrial Workshops - Technical Integration	50
4226	Outreach Program, RFP	100
4105	Microwave Melting	910
4118B	Polymer Solidification Development	500
4119	Saltcrete and Reprocessed Saltcrete	731
4200	Mixed Waste Destruction	400
4205	Liquid Carbon Dioxide Cleaning	200
4217	OTD Team Support	368
4235	Planning for Waste Integrated Demo.	70
4236	Integrated Demo Support-Pu in Soils	500
4237A	Nonchlorinated Solvent Cleaning of Plutonium	210
	Subtotal Office of Technology Development	**7,735**

Technology Development - Base Programs

3245	Final Pu Cleaning with Supercritical Fluid	546
3301	Drum Counter Improvements/Upgrade	240
3401C	Thermal Treatment Process Unit	1350
4101	Gas Generation Studies	180
4120	Cyanide Destruction Process	73
4206	Compliance Order Technical Support	515
4208	Sort at Source	250
4211	Environmental Measurement, Instrumentation	579
4216B	Robotics Application	200
4227	Operating Support - ER	86
4228	Operating Support - WM	377
4229	Operating Support - Resumption	34
4230	TD Operations and Administration	2,666
4231	TD Total Quality Program	684
4232	Technology Investment Strategy	572
4234	TD Waste Minimization Program Management	176
4237B	Nonchlorinated Solvent Cleaning of Plutonium	505
4801	Pneumatic Transfer of Radioactive Material	140
4802	Ca/Ga/Pu Salt Scrub Development	280
4803	Casting of Plutonium Parts in Re-usable Metal Molds	207
4804	Complex Impedance Analysis of Electrorefining	92
4805	Electroreduction of Plutonium and Calcium Oxide	184
4806	Electrorefining with Dicesium Hexachloroplutonate	80
4807	Long-term Implementation of Direct Oxide Reduction	80
4808	Ca and Pu Oxide Metering Device	227
4809	Oxygen Sparging of Salt Residues	41
4810	Electrorefining Waste Minimization	202
4811	Direct Oxide Reduction Spent Salt Chlorination	183

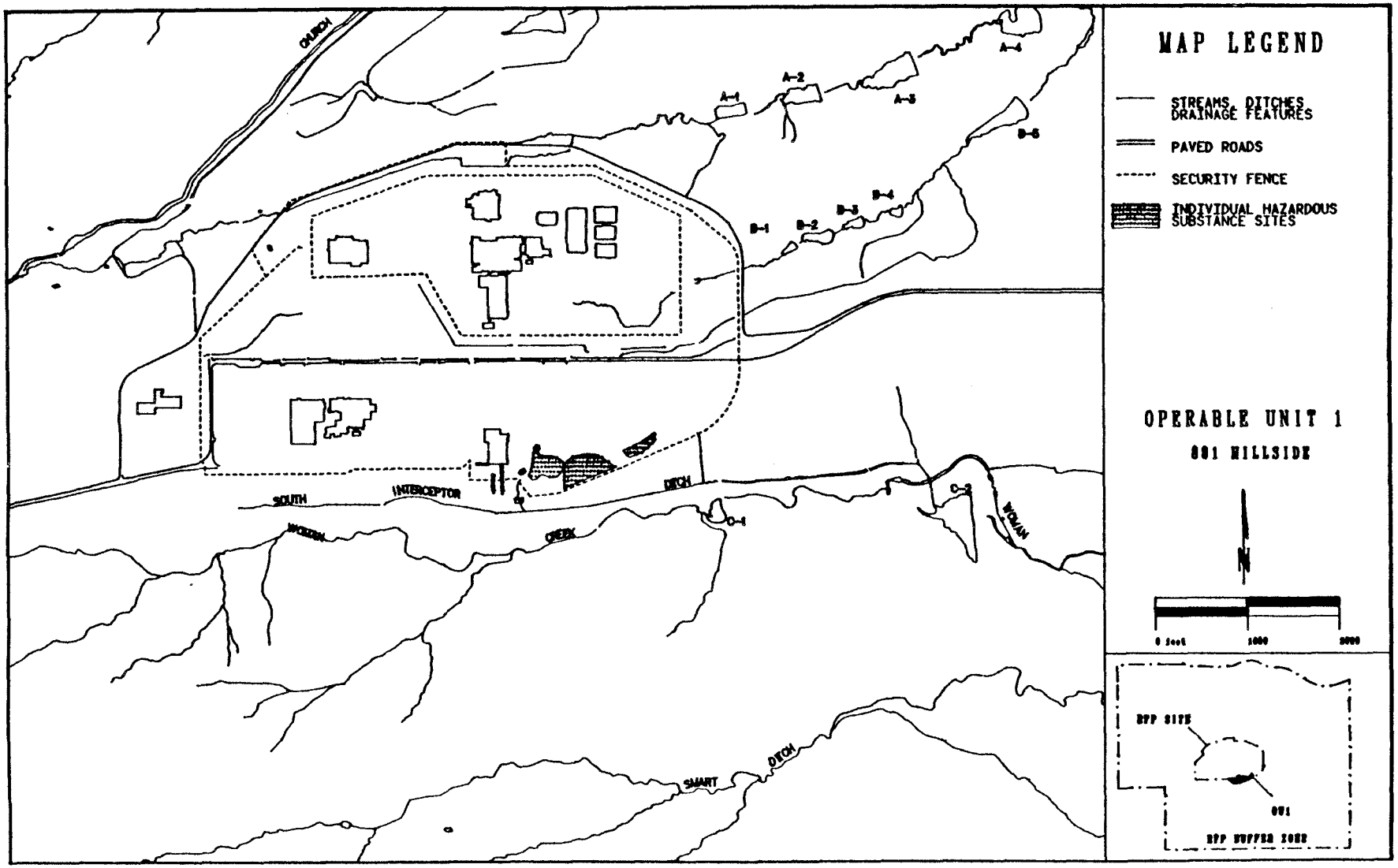
4812	Direct Chloride Reduction of Cs2PuCl6	245	
4813	Short-term Implementation of Direct Oxide	375	
4814	Dry Machining of Plutonium	65	
4815	Aqueous Cleaning of Oralloy Parts	245	
4816	Final Aqueous Plutonium Cleaning (Oil/Solvent)	281	
4817	Centrifuge for Plutonium Chip Cleaning	254	
4818	Chloride Process Development	145	
4819	Batch Precipitation	139	
4820	Nitric Acid Dissolution Technology	141	
	Subtotal Technology Development - Base Programs		**12,743**
	Total Technology Development		**20,478**

APPENDIX B

ENVIRONMENTAL RESTORATION

Operable Unit Maps
Individual Hazardous Substance Sites (IHSSs) by Operable Unit Listing

Operable Unit Maps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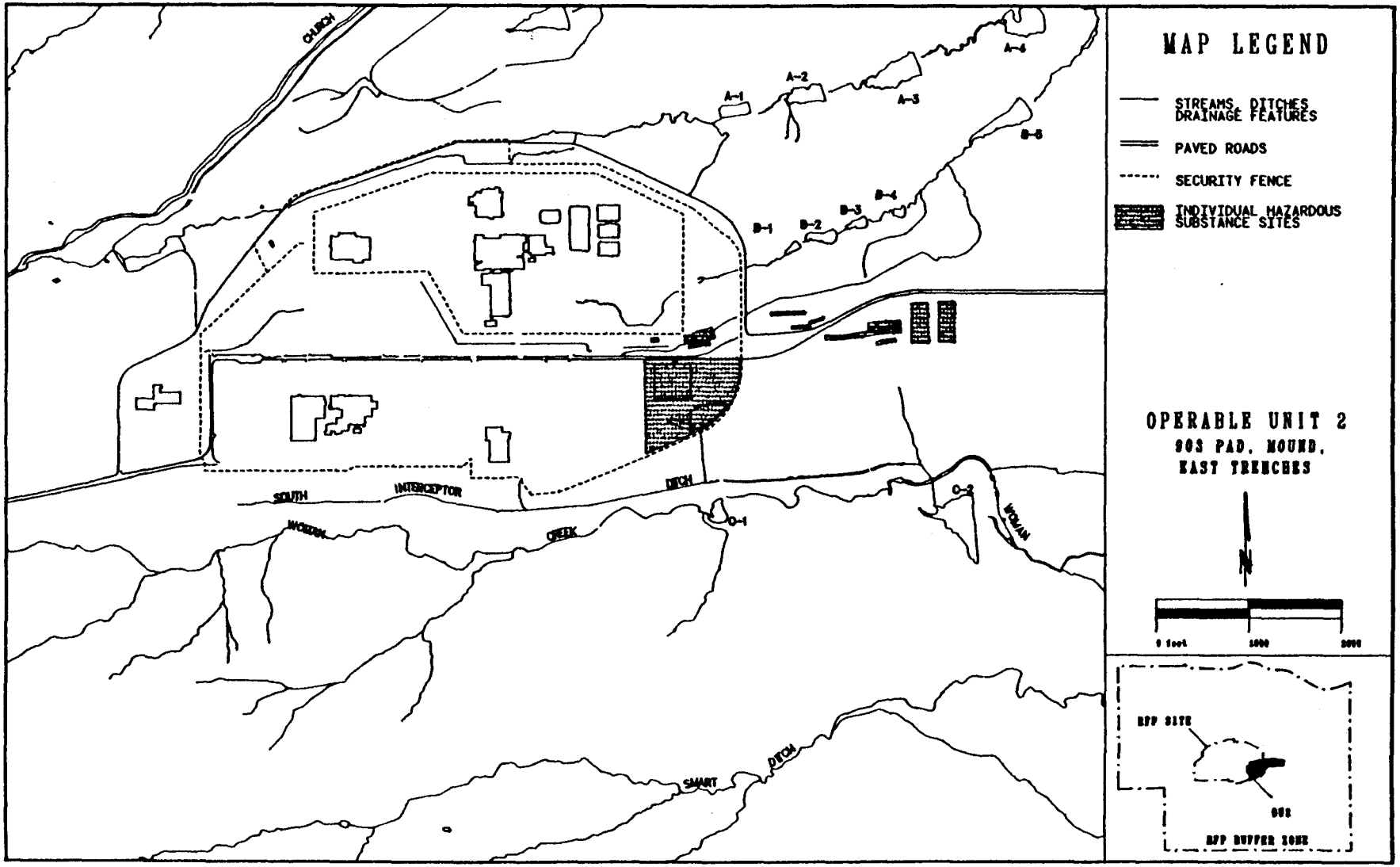
STREAMS, DITCHES, DRAINAGE FEATURES
PAVED ROADS
SECURITY FENCE
INDIVIDUAL HAZARDOUS SUBSTANCE SITES
OPERABLE UNIT 1
801 HILLSIDE
A-1
A-2
A-3
A-4
B-1
B-2
B-3
B-4
B-5
C-1
C-2
CHURCH
SOUTH
INTERCEPTOR
DITCH
WOMAN
CREEK
SMART
DITCH
BPP SITE
801
BPP BUFFER ZONE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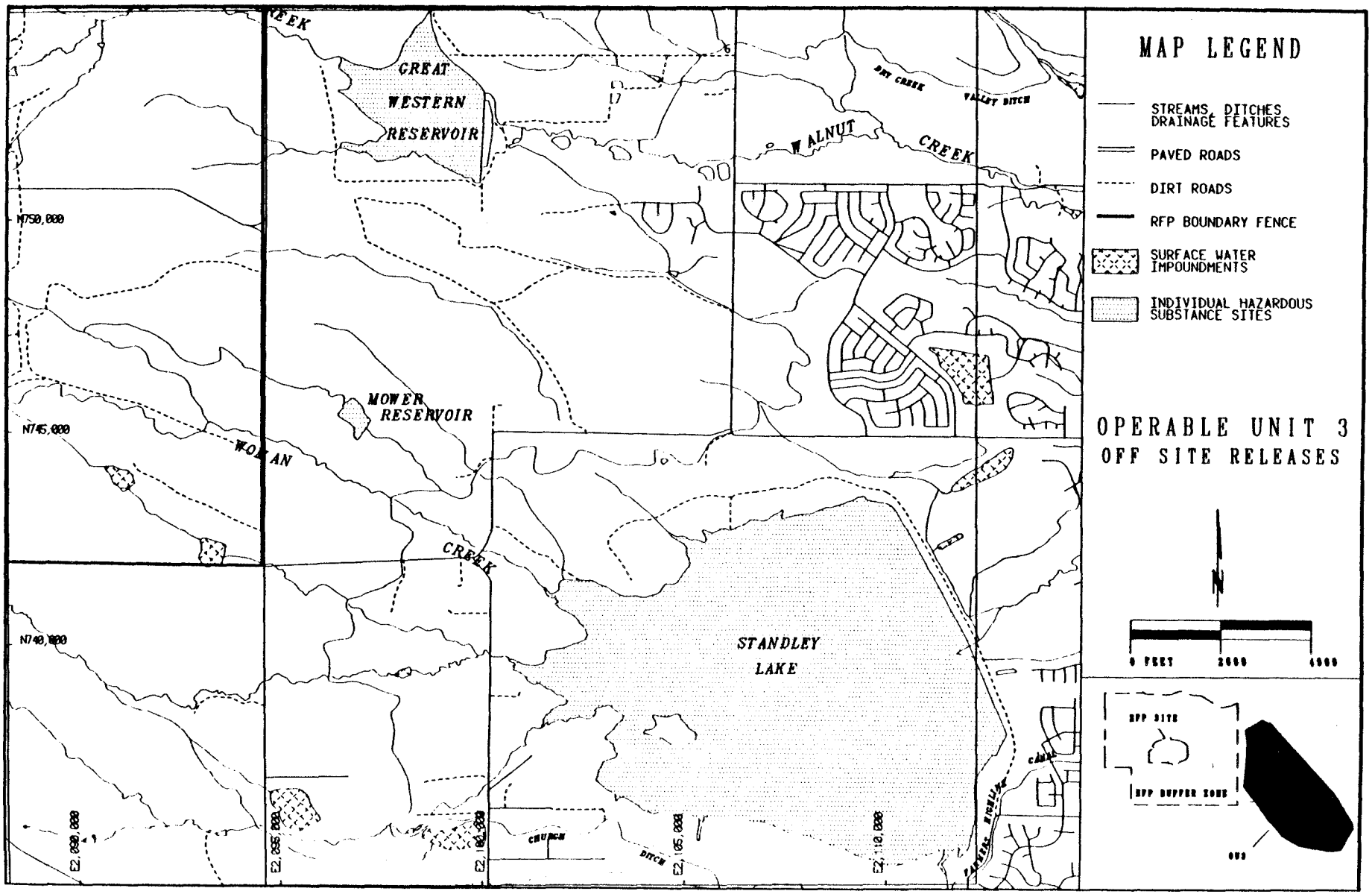
OPERABLE UNIT 2
903 PAD, MOUND, EAST TRENCHES
CHURCH
A-1
A-2
A-3
A-4
B-5
B-1
B-2
B-3
B-4
SOUTH
INTERCEPTOR
DITCH
O-1
O-2
WOMAN
CREEK
SMART
DITCH
RFP SITE
903
RFP BUFFER ZONE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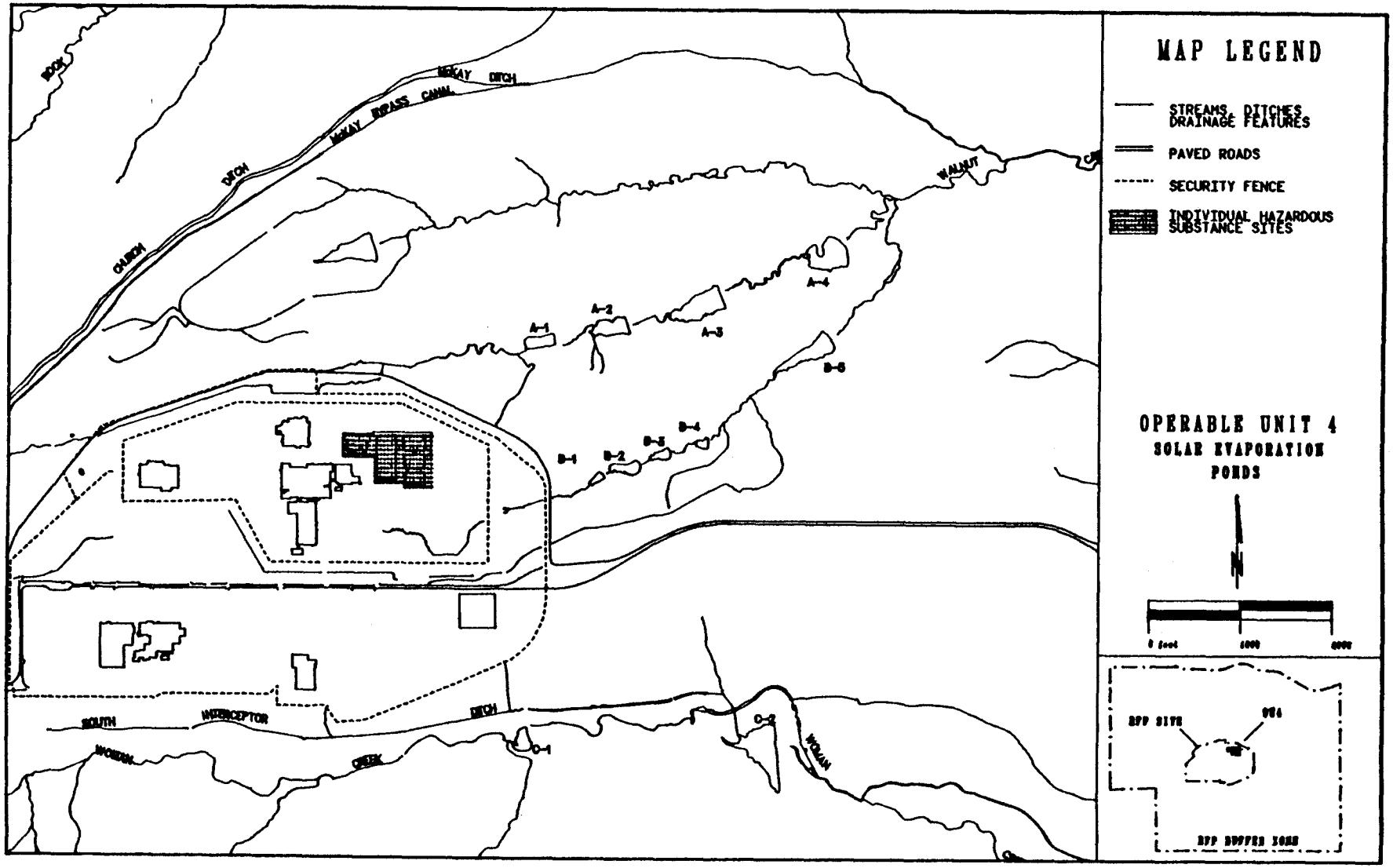
PAVED ROADS
DIRT ROADS
RFP BOUNDARY FENCE
SURFACE WATER IMPOUNDMENTS
INDIVIDUAL HAZARDOUS SUBSTANCE SITES
OPERABLE UNIT 3
OFF SITE RELEASES
GREAT WESTERN RESERVOIR
MOWER RESERVOIR
STANDLEY LAKE
WALNUT CREEK
DRY CREEK
VALLEY DITCH
WOMAN CREEK
CHURCH DITCH
N750,000
N745,000
N740,000
E2,095,000
E2,100,000
E2,105,000
E2,110,000
0 FEET
2000
4000
RFP SITE
RFP BUFFER ZONE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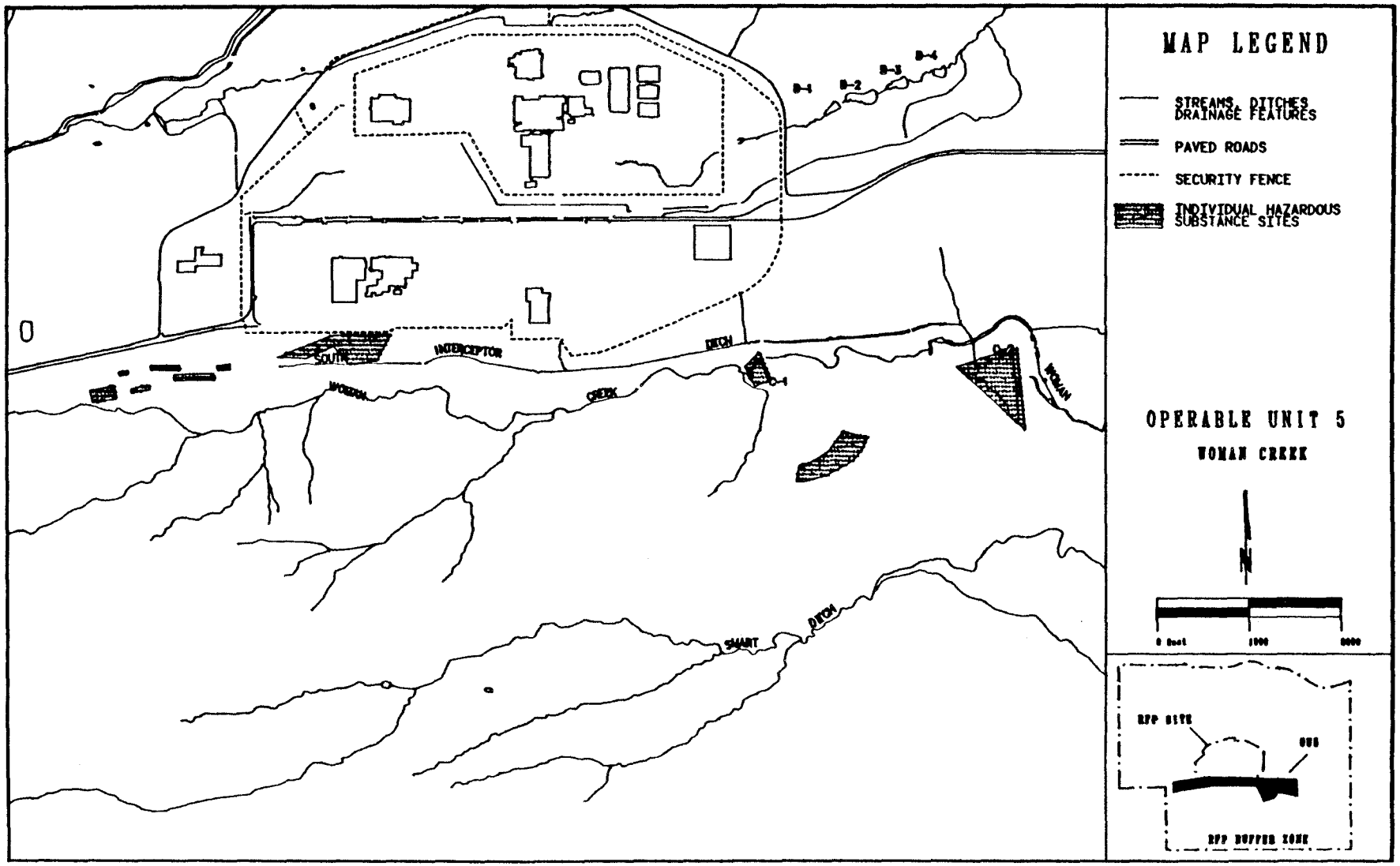
STREAMS, DITCHES DRAINAGE FEATURES
PAVED ROADS
SECURITY FENCE
INDIVIDUAL HAZARDOUS SUBSTANCE SITES
OPERABLE UNIT 4
SOLAR EVAPORATION PONDS
RFP SITE
RFP BUFFER ZONE
MCKAY DITCH
MCKAY BYPASS CANAL
WALNUT
SOUTH INTERCEPTOR DITCH
WOMAN CREEK
WOMAN
A-1
A-2
A-3
A-4
B-1
B-2
B-3
B-4
B-5
C-1
C-2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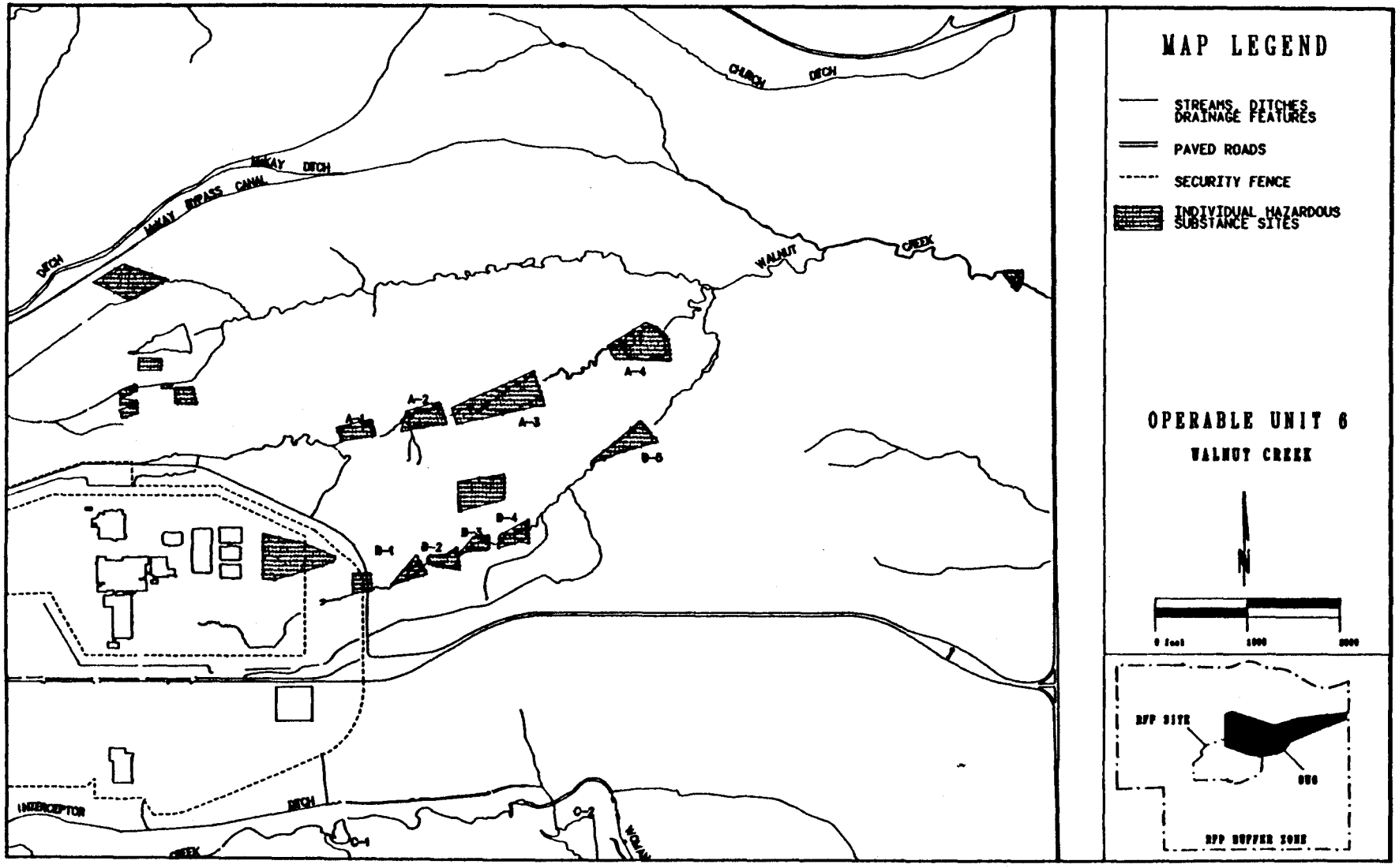
STREAMS, DITCHES, DRAINAGE FEATURES
PAVED ROADS
SECURITY FENCE
INDIVIDUAL HAZARDOUS SUBSTANCE SITES
OPERABLE UNIT 5
WOMAN CREEK
B-1
B-2
B-3
B-4
SOUTH
INTERCEPTOR
DITCH
WOMAN
CREEK
SMART
DITCH
RFP SITE
RFP BUFFER ZONE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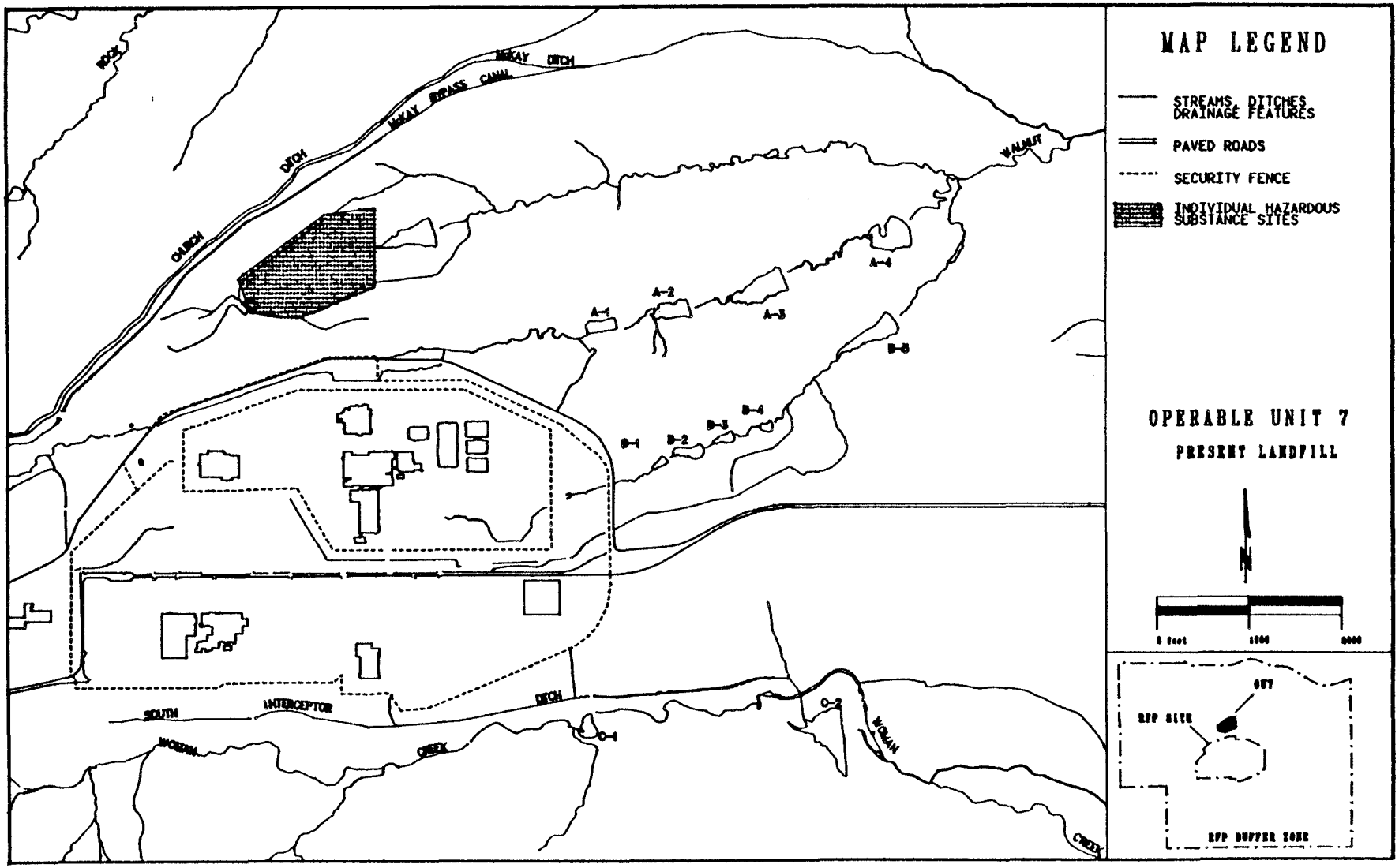
STREAMS, DITCHES DRAINAGE FEATURES
PAVED ROADS
SECURITY FENCE
INDIVIDUAL HAZARDOUS SUBSTANCE SITES
OPERABLE UNIT 6
WALNUT CREEK
N
0 feet
1000
2000
RFP SITE
OU6
RFP BUFFER ZONE
CHURCH DITCH
MCKAY DITCH
MCKAY BYPASS CANAL
DITCH
WALNUT CREEK
A-1
A-2
A-3
A-4
B-1
B-2
B-3
B-4
B-5
C-1
C-2
INTERCEPTOR
DITCH
WOMAN
CREEK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STREAMS, DITCHES DRAINAGE FEATURES
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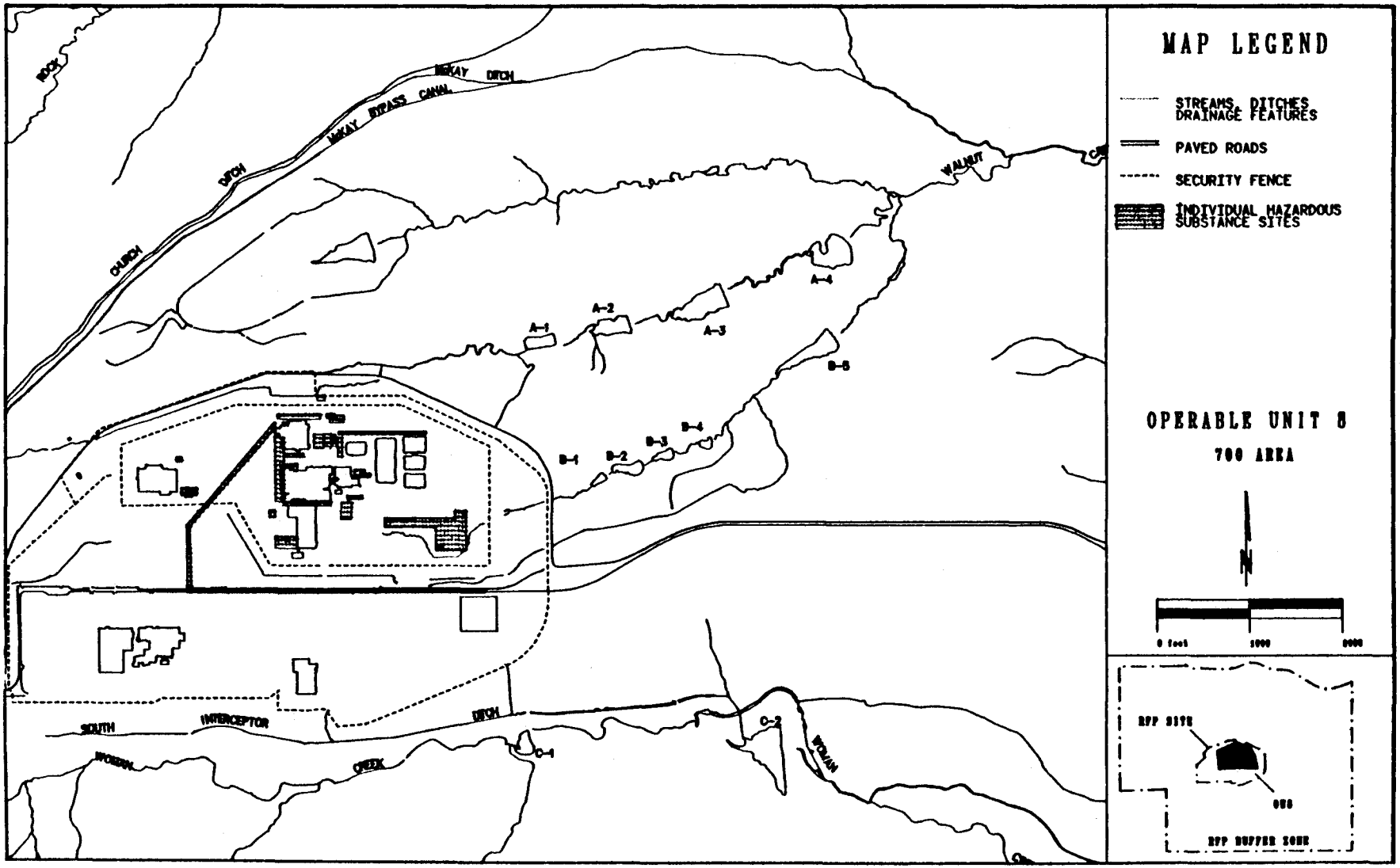
SECURITY FENCE
INDIVIDUAL HAZARDOUS SUBSTANCE SITES
OPERABLE UNIT 7
PRESENT LANDFILL
N
0 feet
1000
2000
OUT
RFP SITE
RFP BUFFER ZONE
ROCK
DITCH
CHURCH
McKAY DITCH
McKAY BYPASS CANAL
WALNUT
A-1
A-2
A-3
A-4
B-1
B-2
B-3
B-4
B-5
C-1
C-2
SOUTH
INTERCEPTOR
DITCH
WOMAN
CREEK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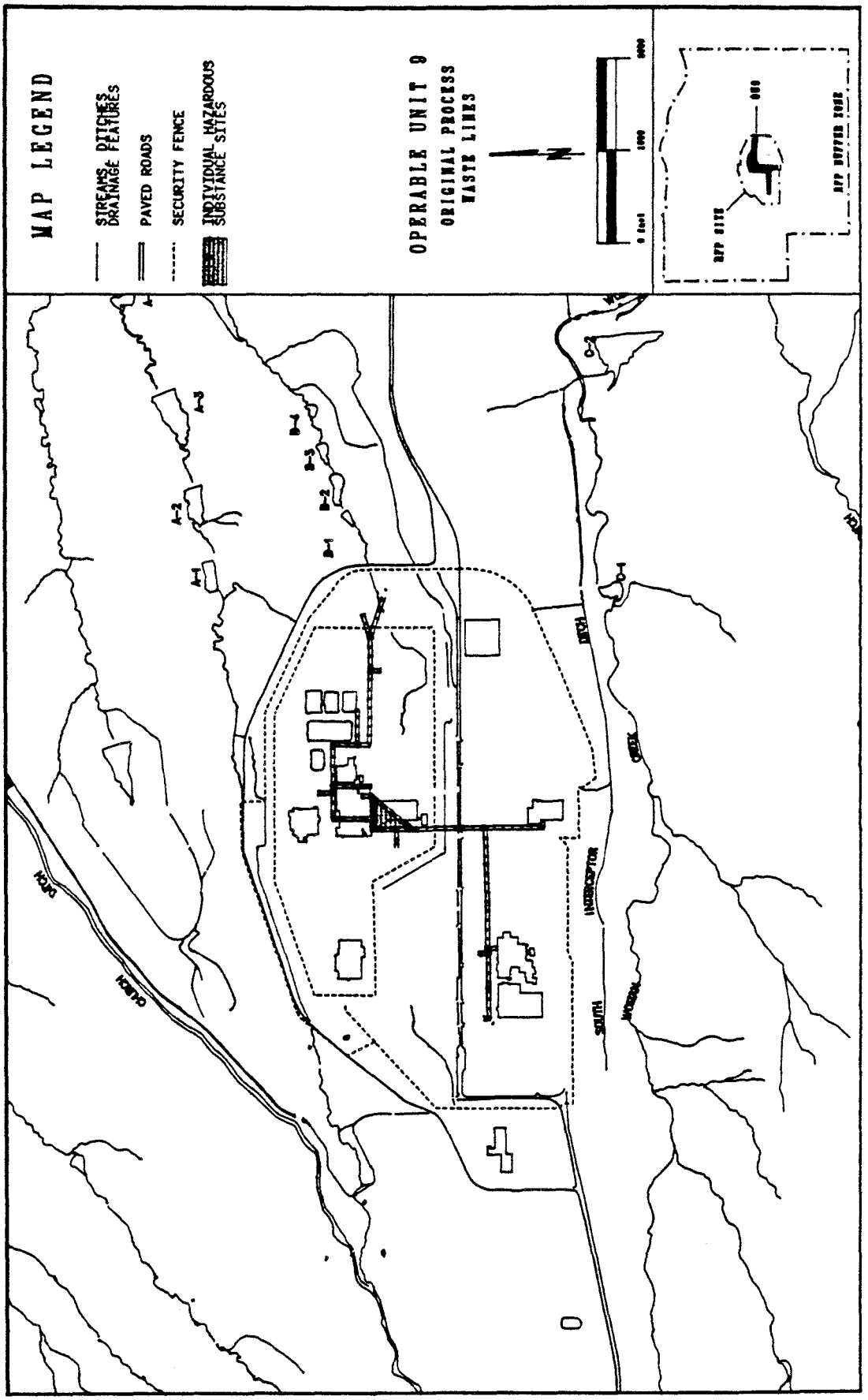
STREAMS, DITCHES DRAINAGE FEATURES
PAVED ROADS
SECURITY FENCE
INDIVIDUAL HAZARDOUS SUBSTANCE SITES
OPERABLE UNIT 8
700 AREA
N
0 feet
1000
2000
RFP SITE
RFP BUFFER ZONE
ROCK
DITCH
CHURCH
McKAY DITCH
McKAY BYPASS CANAL
WALNUT
A-1
A-2
A-3
A-4
B-1
B-2
B-3
B-4
B-5
C-1
C-2
SOUTH
INTERCEPTOR
DITCH
WOMAN
CREEK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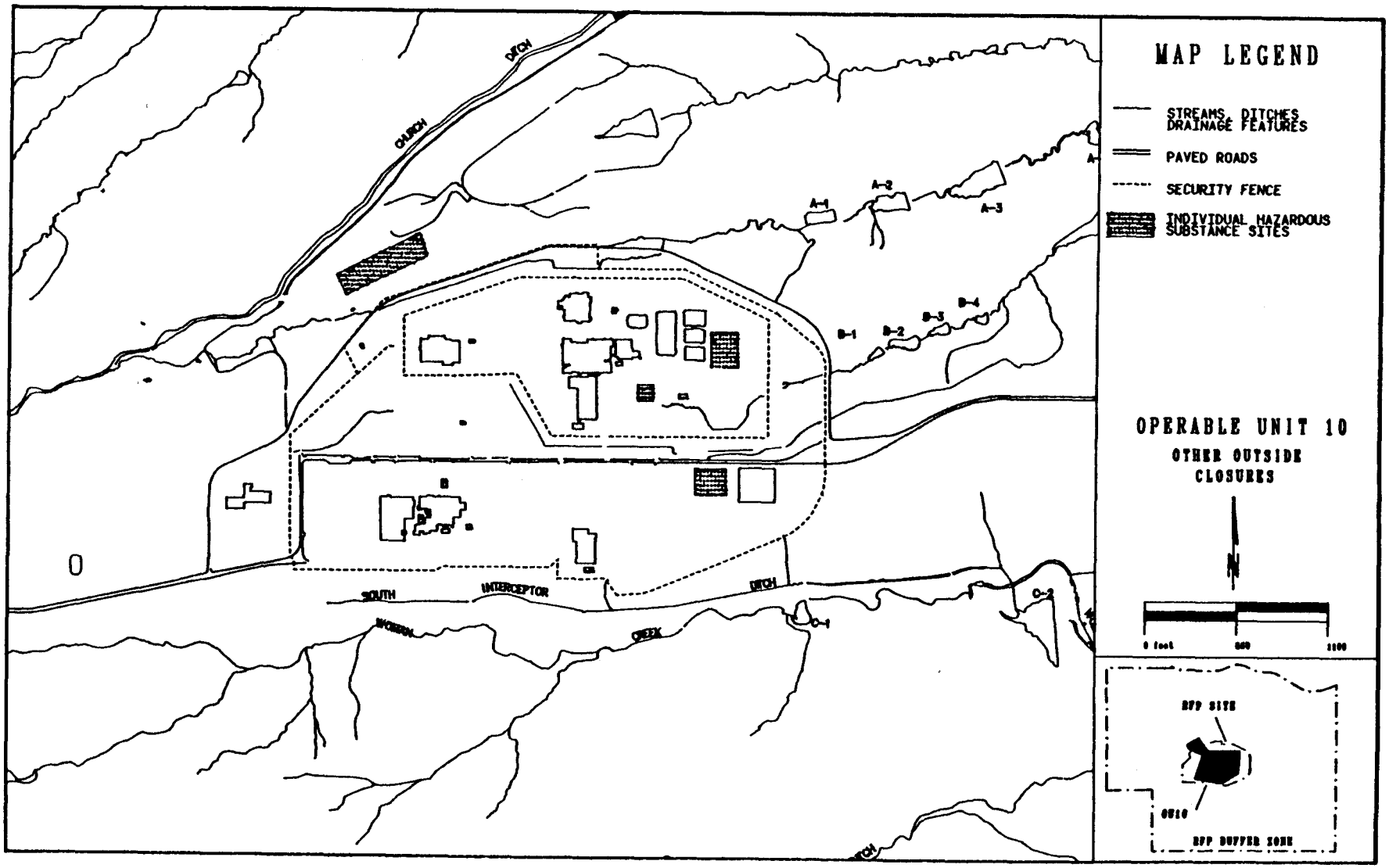
PAVED ROADS
SECURITY FENCE
INDIVIDUAL HAZARDOUS SUBSTANCE SITES
OPERABLE UNIT 9
ORIGINAL PROCESS WASTE LINES
NORTH
SOUTH
A-1
A-2
A-3
B-1
B-2
B-3
B-4
C-1
C-2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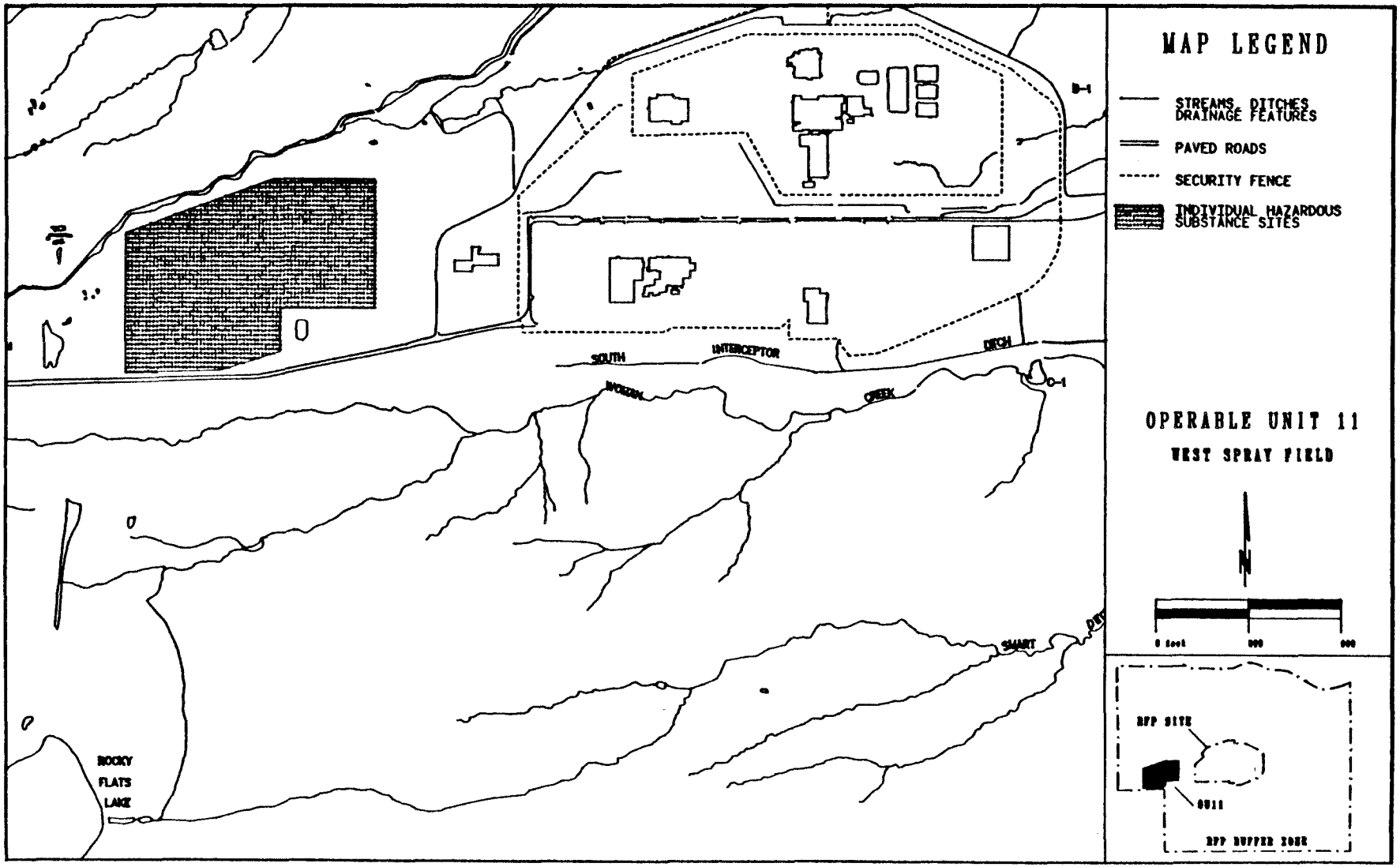
INDIVIDUAL HAZARDOUS SUBSTANCE SITES
OPERABLE UNIT 10
OTHER OUTSIDE CLOSURES
N
0 feet
600
1200
RFP SITE
OU10
RFP BUFFER ZONE
DITCH
CHURCH
SOUTH
INTERCEPTOR
DITCH
WOMAN
CREEK
A-1
A-2
A-3
B-1
B-2
B-3
B-4
C-1
C-2
0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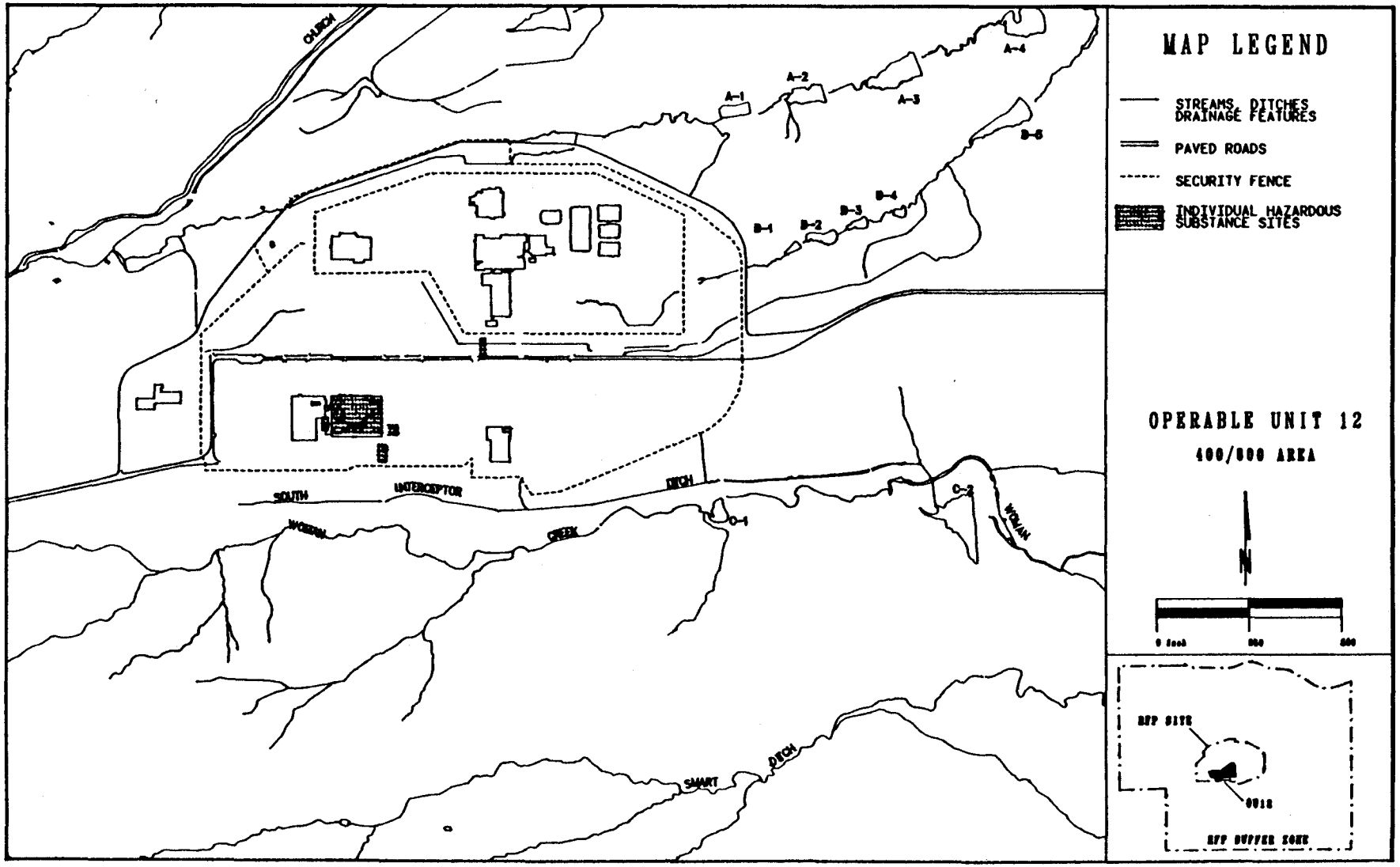
PAVED ROADS
SECURITY FENCE
INDIVIDUAL HAZARDOUS SUBSTANCE SITES
OPERABLE UNIT 11
WEST SPRAY FIELD
SOUTH
INTERCEPTOR
DITCH
WOMAN
CREEK
SMART
ROCKY
FLATS
LAKE
B-1
C-1
RFP SITE
OU11
RFP BUFFER ZONE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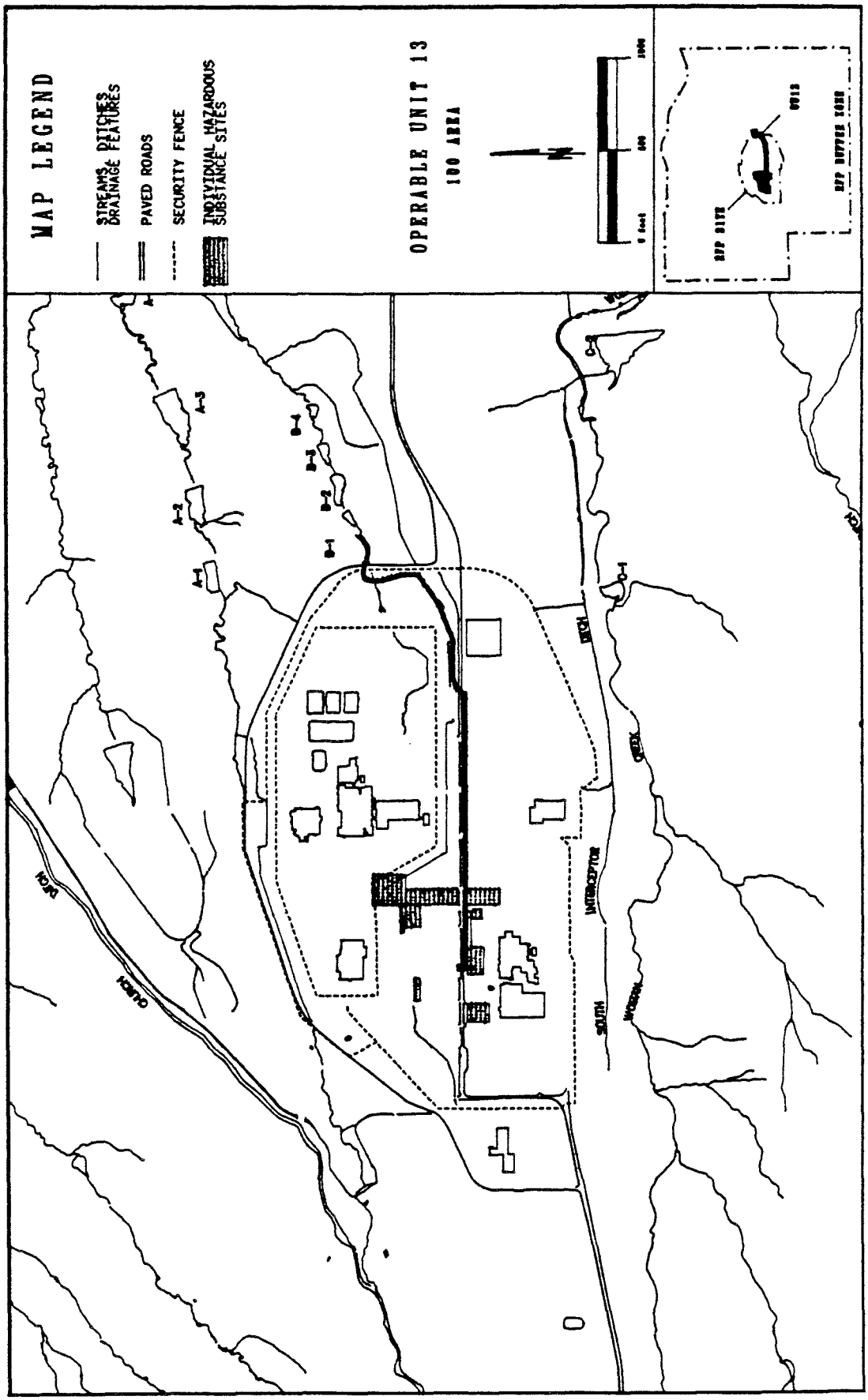
SECURITY FENCE
INDIVIDUAL HAZARDOUS SUBSTANCE SITES
OPERABLE UNIT 12
400/800 AREA
CHURCH
A-1
A-2
A-3
A-4
B-1
B-2
B-3
B-4
B-5
SOUTH
INTERCEPTOR
DITCH
WOMAN
CREEK
C-1
C-2
WOMAN
SMART
DITCH
RFP SITE
RFP BUFFER ZONE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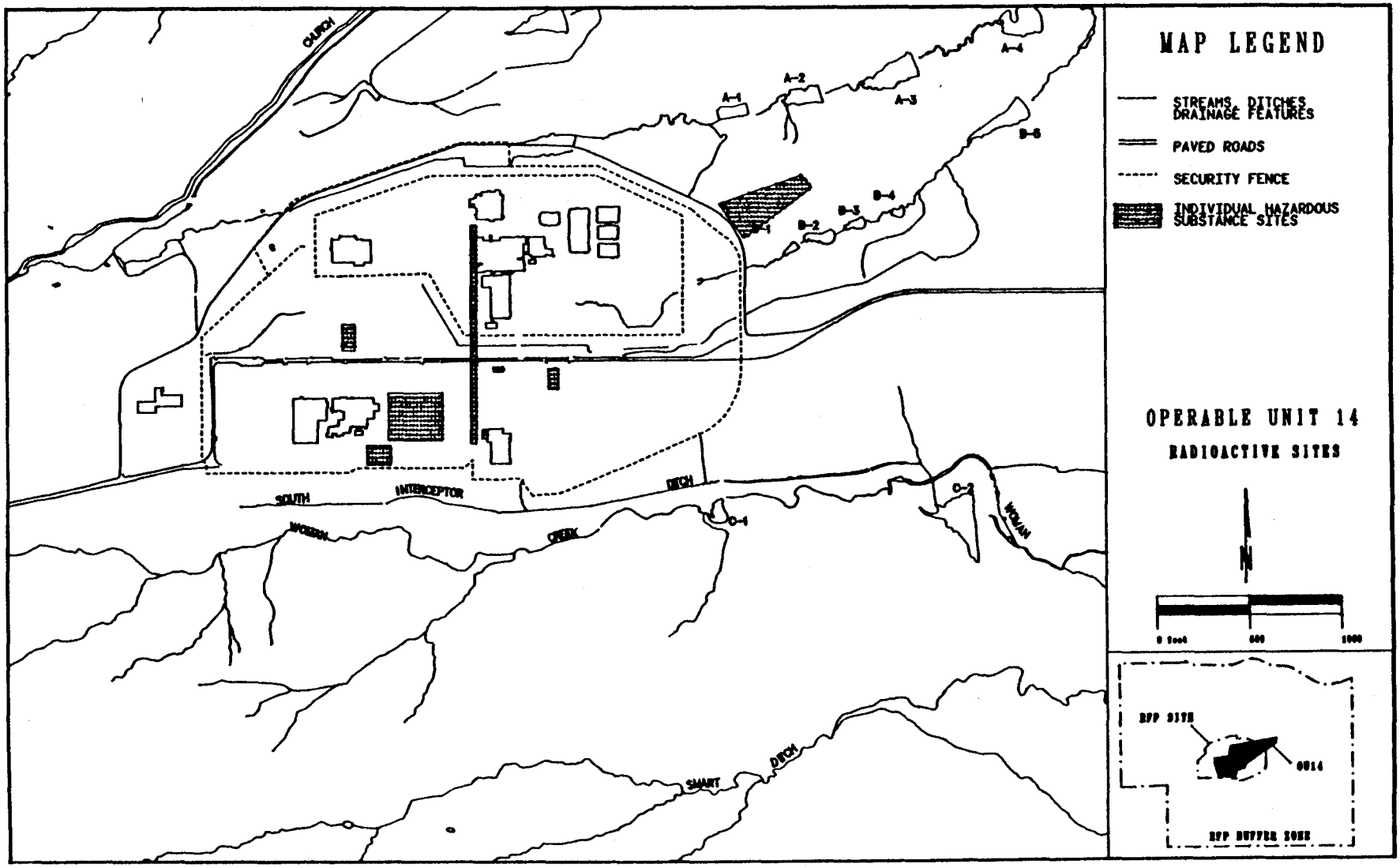
SECURITY FENCE
INDIVIDUAL HAZARDOUS SUBSTANCE SITES
OPERABLE UNIT 13
100 AREA
A-1
A-2
A-3
B-1
B-2
B-3
B-4
D-1
SOUTH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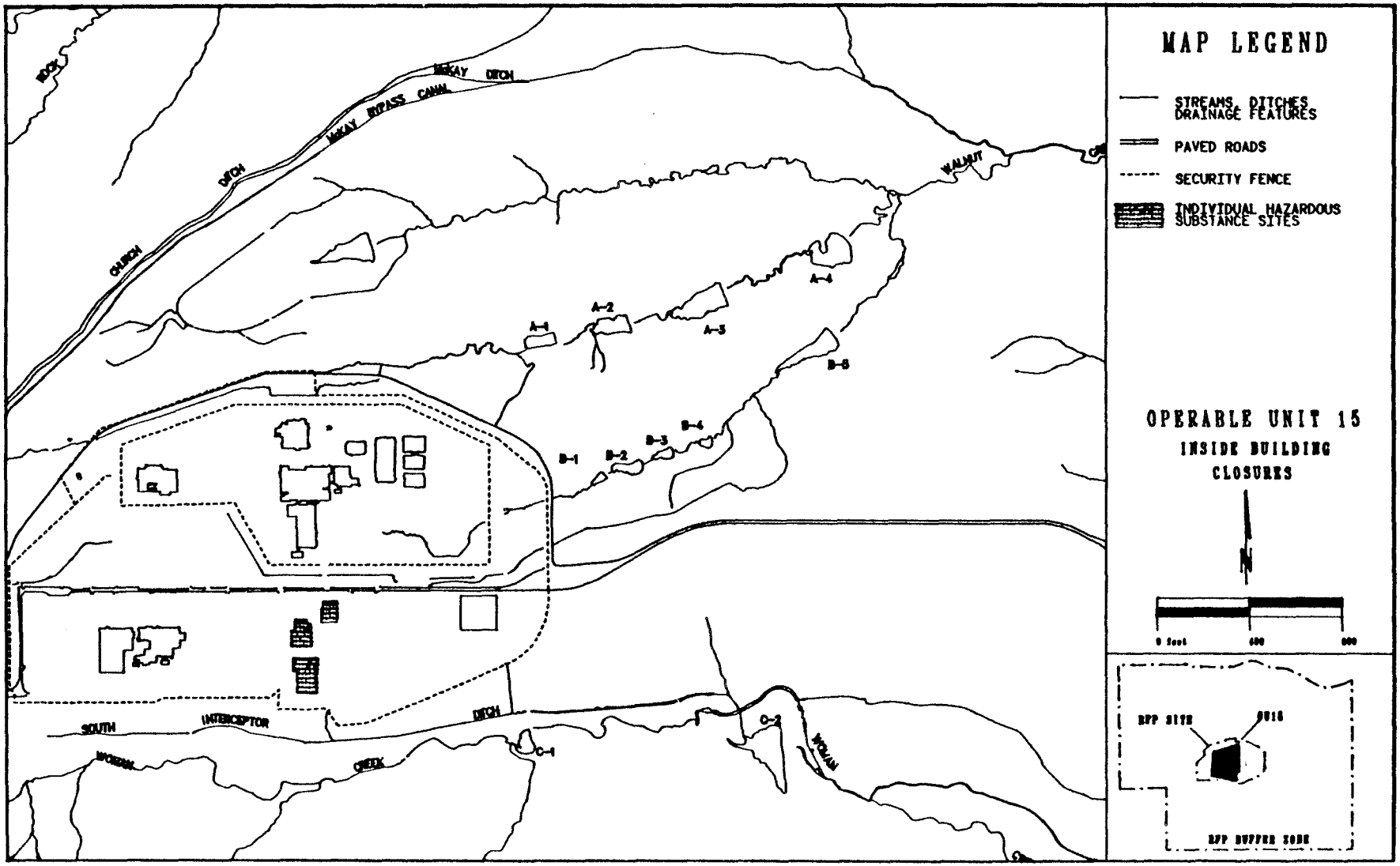
STREAMS, DITCHES DRAINAGE FEATURES
PAVED ROADS
SECURITY FENCE
INDIVIDUAL HAZARDOUS SUBSTANCE SITES
OPERABLE UNIT 14
RADIOACTIVE SITES
CHURCH
A-1
A-2
A-3
A-4
B-1
B-2
B-3
B-4
B-5
C-1
C-2
SOUTH
INTERCEPTOR
DITCH
WOMAN
CREEK
SMART
DITCH
RFP SITE
0014
RFP BUFFER ZONE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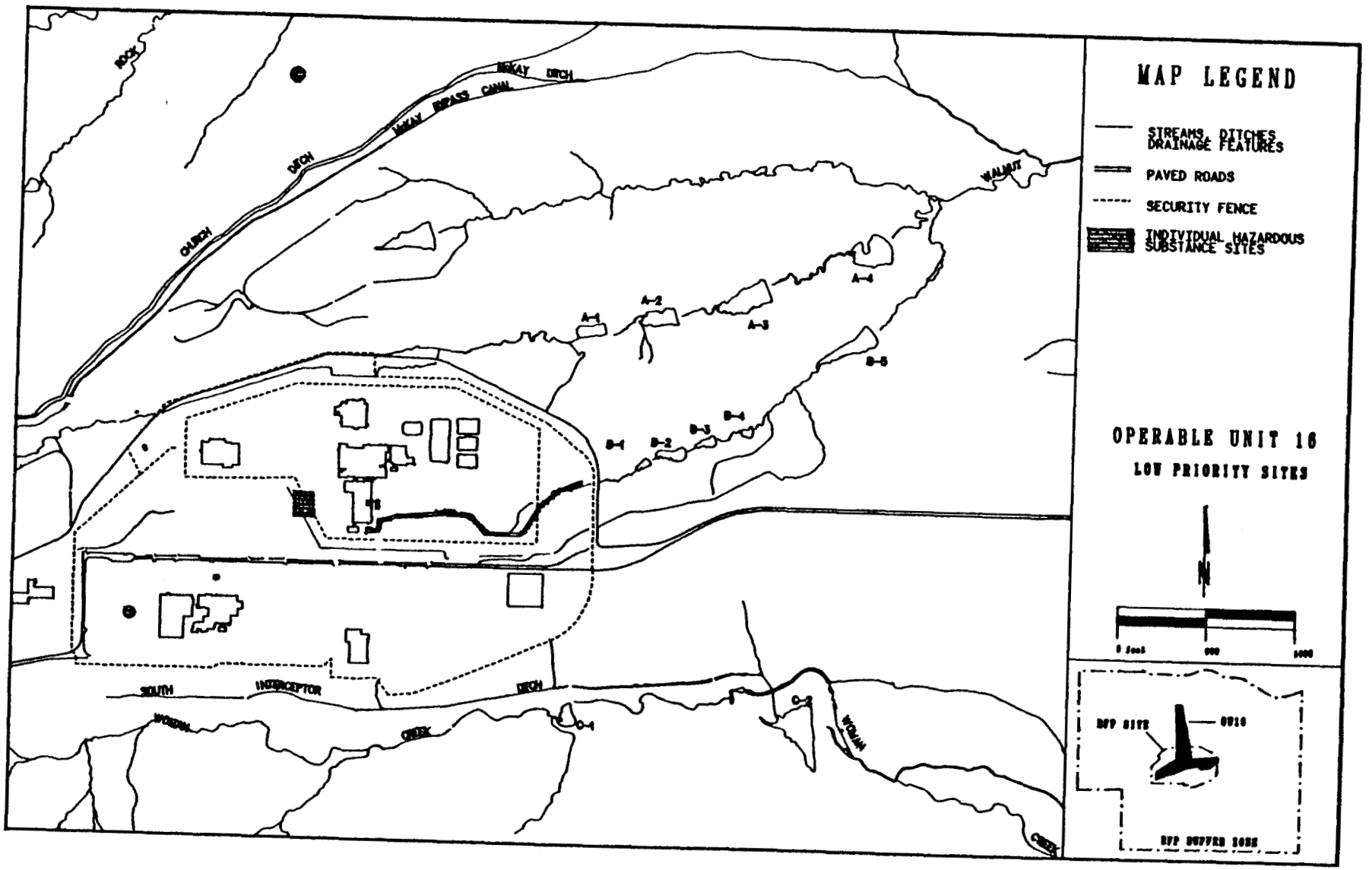
STREAMS, DITCHES, DRAINAGE FEATURES
PAVED ROADS
SECURITY FENCE
INDIVIDUAL HAZARDOUS SUBSTANCE SITES
OPERABLE UNIT 15
INSIDE BUILDING CLOSURES
MCKAY DITCH
MCKAY BYPASS CANAL
DITCH
WALNUT
A-1
A-2
A-3
A-4
B-1
B-2
B-3
B-4
B-5
SOUTH
INTERCEPTOR
DITCH
C-1
C-2
WOMAN
CREEK
0 feet
400
800
RFP SITE
RFP BUFFER ZONE


MAP LEGEND
STREAMS, DITCHES, DRAINAGE FEATURES
PAVED ROADS
SECURITY FENCE
INDIVIDUAL HAZARDOUS SUBSTANCE SITES
OPERABLE UNIT 16
LOW PRIORITY SITES
ROCK
CREEK
DITCH
WALNUT
A-1
A-2
A-3
A-4
B-1
B-2
B-3
B-4
B-5
SOUTH
INTERCEPTOR
DITCH
O-1
O-2

Individual Hazardous Substance Sites (IHSSs) by Operable Unit Listing

Individual Hazardous Substance Sites (IHSSs) by Operable Unit Listing

Operable Unit	Individual Hazardous Substance Site Number	Individual Hazardous Substance Site Name
OU 1 881 Hillside	102	Oil Sludge Pit
	103	Chemical Burial Area
	104	Liquid Dumping Pit
	105.1	Out-of-Service Fuel Tank - West Tank
	105.2	Out-of-Service Fuel Tank - East Tank
	106	Outfall
	107	Hillside Oil Leak
	119.1	Multiple Solvent Spills - West Area
	119.2	Multiple Solvent Spills - East Area
	130	Radioactive Site - 800 Area Site #1
	145	Sanitary Waste Line Leak
OU 2 903 Pad, Mound, and East Trenches	108	Trench T-1
	109	Trench T-2
	110	Trench T-3
	111.1	Trench T-4
	111.2	Trench T-5
	111.3	Trench T-6
	111.4	Trench T-7
	111.5	Trench T-8

	111.6	Trench T-9
	111.7	Trench T-10
	111.8	Trench T-11
	112	903 Drum Storage Area
	113	Mound Area
	140	Reactive Metal Destruction Site
	153	Oil Burn Pit #2
	154	Pallet Burn Site
	155	903 LIP Area
	183	Gas Detoxification Area
	216.2	East Spray Field - Center Area
	216.3	East Spray Field - South Area
OU 3 Offsite Releases	199	Contamination of Land Surface
	200	Great Western Reservoir
	201	Standley Reservoir
	202	Mower Reservoir
OU 4 Solar Ponds	101	207 Solar Evaporation Ponds (OC)
OU 5 Woman Creek	115	Original Landfill
	133.1	Ash Pit 1-1
	133.2	Ash Pit 1-2
	133.3	Ash Pit 1-3

	133.4	Ash Pit 1-4
	133.5	Incinerator
	133.6	Concrete Wash Pad
	142.10	Retention Pond C-1
	142.11	Retention Pond C-2
	209	Surface Disturbance SE of Bldg. 881
OU 6 Walnut Creek	141	Sludge Dispersal
	142.1	Retention Pond A-1
	142.2	Retention Pond A-2
	142.3	Retention Pond A-3
	142.4	Retention Pond A-4
	142.5	Retention Pond B-1
	142.6	Retention Pond B-2
	142.7	Retention Pond B-3
	142.8	Retention Pond B-4
	142.9	Retention Pond B-5
	142.12	Retention Pond A-5
	143	Old Outfall
	165	Triangle Area
	166.1	Trench A
	166.2	Trench B
	166.3	Trench C

	167.1	Spray Fields - North Area
	167.2	Spray Fields - Pond Area
	167.3	Spray Field - South Area
	216.1	East Spray Field - North Area
OU 7 Present Landfill	114	Present Landfill (OC)
	203	Inactive Hazardous Waste Storage Area (OC)
OU 8 700 Area	118.1	Multiple Solvent Spills - West of Bldg. 730
	118.2	Multiple Solvent Spills - South of Bldg. 776
	123.1	Valve Vault West of Bldg. 707
	125	Holding Tank
	126.1	Out-of-Service Process Waste Tanks - Westernmost Tank
	126.2	Out-of-Service Process Waste Tanks - Easternmost Tank
	127	Low-Level Radioactive Waste Leak
	132	Radioactive Site - 700 Area Site #4
	135	Cooling Tower Blowdown
	137	Cooling Tower Blowdown - Bldg. 774
	138	Cooling Tower Blowdown - Bldg. 779
	139.1	Caustic/Acid Spills - Hydroxide Acid Tanks

139.2	Caustic/Acid Spill - Hydrofluoric Acid Tanks
144	Sewer Line Break
146.1	Concrete Process Waste Tanks - 7,500-Gallon Tank (#31)
146.2	Concrete Process Waste Tanks - 7,500-Gallon Tank (#32)
146.3	Concrete Process Waste Tanks - 7,500-Gallon Tank (#34W)
146.4	Concrete Process Waste Tanks - 7,500-Gallon Tank (#34E)
146.5	Concrete Process Waste Tanks - 3,750-Gallon Tank (#30)
146.6	Concrete Process Waste Tanks - 3,750-Gallon Tank (#33)
149	Effluent Pipe
150.1	Radioactive Liquid Leaks - North of Bldg. 771
150.2	Radioactive Liquid Leaks - West of Bldg. 771
150.3	Radioactive Liquid Leaks - Between Bldg. 771 and 774
150.4	Radioactive Liquid Leaks - East of Bldg. 750
150.5	Radioactive Liquid Leaks - West of Bldg. 707
150.6	Radioactive Liquid Leaks - South of Bldg. 779
150.7	Radioactive Liquid Leaks - South of

		Bldg. 776
	150.8	Radioactive Liquid Leaks - NE of Bldg. 779
	151	Fuel Oil Leak
	159	Radioactive Site - Bldg. 559
	163.1	Radioactive Site - 700 Area Site #2 Wash Area
	163.2	Radioactive Site - 700 Area Site #3 Wash Area
	172	Central Avenue Waste Spill
	173	Radioactive Site - 900 Area
	184	Bldg. 991 Steam Cleaning Area
	188	Acid Leak
OU 9 Original Process Waste Lines	121	Original Process Waste Lines
OU 10 Other Outside Closures	124.1	Radioactive Liquid Waste Storage Tank - 30,000-Gallon Tank (#68)
	124.2	Radioactive Liquid Waste Storage Tank - 14,000-Gallon Tank (#66)
	124.3	Radioactive Liquid Waste Storage Tank - 14,000-Gallon Tank (#67))
	129	Oil Leak
	170	PU&D Storage Yard - Waste Spills
	174	PU&D Container Storage Facilities (2) (OOC)

	175	S&W Bldg. 980 Container Storage Facility (OOC)
	176	S&W Contractor Storage Yard
(OOC)	177	Bldg. 885 Drum Storage Area (OOC)
	181	Bldg. 334 Cargo Container Area (OOC)
	182	Bldg. 444/453 Drum Storage Area (OOC)
	205	Bldg. 460 Sump #3 Acid Side (OOC)
	206	Inactive D-836 Hazardous Waste Tank (OOC)
	207	Inactive 444 Acid Dumpster (OOC)
	208	Inactive 444/447 Waste Storage Area (OOC)
	210	Unit 16, Bldg. 980 Cargo Container (IBC)
	213	Unit 15, 904 Pad Pondcrete Storage (OOC)
	214	Unit 25, 750 Pad Pondcrete and Saltcrete Storage (OOC)
OU 11 West Spray Field	168	West Spray Field (OC)
OU 12 400/800 Area	116.1	Multiple Solvent Spills - West Loading Dock Area
	116.2	Multiple Solvent Spills - South Loading Dock Area
	120.1	Fiberglassing Area - North of Bldg.

		664
	120.2	Fiberglassing Area - West of Bldg. 664
	136.1	Cooling Tower Ponds - NE Corner of Bldg. 460
	136.2	Cooling Tower Ponds - West of Bldg. 460
	136.3	Cooling Tower Ponds - South of Bldg. 460, West of Bldg. 779
	147.1	Process Waste Leaks - Maas Area
	147.2	Process Waste Leaks - Owen Area
	157.2	Radioactive Site - South Area
	187	Acid Leaks (2)
	189	Multiple Acid Spills
OU 13 100 Area	117.1	Chemical Storage - North Site
	117.2	Chemical Storage - Middle Site
	117.3	Chemical Storage - South Site
	122	Underground Concrete Tank
	128	Oil Burn Pit No. 1
	134	Lithium Metal Destruction Site
	148	Waste Spills
	152	Fuel Oil Leak
	157.1	Radioactive Site - North Area
	158	Radioactive Site - Bldg. 551

	169	Waste Drum Peroxide Burial
	171	Solvent Burning Ground
	186	Valve Vault 12
	190	Caustic Leak
	191	Hydrogen Peroxide Spill
OU 14 Radioactive Sites	131	Radioactive Site - 700 Area Site #1
	156.1	Radioactive Soil Burial - Bldg. 334 Parking Lot
	156.2	Soil Dump Area
	160	Radioactive Site - Bldg. 444 Parking Lot
	161	Radioactive Site - Bldg. 664
	162	Radioactive Site - Bldg. 700 Area Site #2
	164.1	Radioactive Site - 800 Area Site #2, Concrete Slab
	164.2	Radioactive Site - 800 Area Site #2, Bldg. 886 Spills
	164.3	Radioactive Site - 800 Area Site #2, Bldg. 889 Storage Pad
OU 15 Inside Building Closures	178	Bldg. 881 Drum Storage Area (IBC)
	179	Bldg. 865 Drum Storage Area (IBC)
	180	Bldg. 883 Drum Storage Area (IBC)
	204	Original Uranium Chip Roaster (IBC)

	211	Unit 26, Bldg. 881 Drum Storage
	212	Unit 63, Bldg. 371 Drum Storage (IBC)
	215	Units 55.13, 55.14, 55.15, 55.16 - Tanks T-40, T-66, T-67, T-68 (OOC)
	217	Unit 32, Bldg. 881, CN Bench Scale Treatment (OOC)
OU 16 Low-Priority Sites	185	Solvent Spill
	192	Antifreeze Discharge
	193	Steam Condensate Leak
	194	Steam Condensate Leak
	195	Nickel Carbonyl Disposal
	196	Water Treatment Plant Backwash Pond
	197	Scrap Metal Sites

APPENDIX C

FEDERAL, STATE, AND LOCAL REQUIREMENTS AND ACCEPTANCE CRITERIA

FEDERAL, STATE, AND LOCAL REGULATORY REQUIREMENTS AND ACCEPTANCE CRITERIA

One of the Rocky Flats goals is compliance with all applicable environmental regulations and conditions set by federal, state, and local regulatory requirements. Many of the activities in the DOE FYP are specifically needed to achieve or maintain compliance. The regulations and associated permits that drive ER&WM activities, the responsible DOE organization, and a brief discussion of the goals and objectives of each regulation are summarized below. Waste Acceptance Criteria promulgated by the WIPP and Nevada Test Site are also listed.

- Antiquities Act - The Antiquities Act provides for protection of historic remains and monuments on federal lands by establishing penalties for destroying historic ruins on public lands. Compliance with this act is most likely to be of concern during evaluation of the environmental impact of a pending decision or action; therefore, responsibility within DOE/RFO is assigned to the Environmental Restoration Division.

- Archaeological Resources Protection Act - The Archaeological Resources Protection Act requires that a permit from the Federal Land Manager (DOI) be obtained before excavating and removing archaeological resources from public lands. This action is most likely to occur during evaluation of the environmental impact of a pending action or decision; therefore, responsibility within DOE/RFO is assigned to the Environmental Restoration Division.

- Bald and Golden Eagle Protection Act - The Bald and Golden Eagle Protection Act affords protection to bald and golden eagles by establishing penalties for unauthorized taking, possession, selling, purchase, or transportation of eagles, their nests, or their eggs. Permits may be issued for taking or distributing eagles or their nests for certain purposes.

  Compliance with this act is most likely to be of concern during evaluation of the environmental impact of a pending decision or action; therefore, responsibility within DOE/RFO is assigned to the Environmental Restoration Division.

- Clean Air Act - The CAA provides the statutory basis for regulating contaminant materials entering the atmosphere. The Act places most of the responsibility on states to achieve compliance with air quality standards. Regulation is achieved through development and implementation of regional air quality control programs, and each state is required to establish and enforce primary and secondary air quality standards. The State of Colorado

has complied with the federal requirements by passing and implementing the Colorado Air Quality Control Act.

The CAA and the Colorado Air Quality Act include requirements for notification, record keeping, performance testing, and monitoring for new stationary sources. In addition, Colorado requires submittal of APENs for all emissions of hazardous, criteria, or toxic air pollutants, with exceptions for sources of minor significance.

The Clean Air Act Amendments of 1990 were signed into law on November 15, 1990. Many of the new regulatory requirements will take 10 or 20 years (or longer) before they are placed in full effect. The amendments include principal features regarding nonattainment areas, auto standards/clean fuels, air toxics, acid rain, chlorofluorocarbons, permit requirements, and strengthening of enforcement. A list of 189 hazardous air pollutants is set forth in the amendments, as are requirements for EPA to promulgate new control standards for most sources of such emissions.

Compliance with the CAA for Rocky Flats consists primarily of monitoring emission sources to document compliance with emissions standards and permits. The DOE Environmental Monitoring Branch has primary responsibility. However, responsibility for maintaining compliance is assigned to the organization having operational responsibility for the unit causing the emission. The Clean Air Division of EG&G Rocky Flats is currently providing APEN reports to CDH for every building on plant site, regardless of the existence of air emissions from the building. The reports briefly describe building processes, and any associated emissions are estimated for reporting requirements. Explanations are provided for processes that do not emit air pollutants.

- Clean Water Act (CWA) - The CWA provides the statutory basis for regulating the discharge of pollutants into the waters of the United States. Colorado water is regulated by both federal law and the Colorado Water Quality Control Act. These regulations control direct discharge to oceans or surface waters (including wetlands), discharges of dredged or fill material in waters of the United States, and indirect discharges to publicly owned treatment works.

  The CWA requires permits for discharges from point sources under NPDES. EPA has approved the Colorado NPDES program for implementation. The Colorado program expands the federal definition of surface waters to include all surface and subsurface waters.

For Rocky Flats, demonstrating compliance with the CWA consists primarily of monitoring point-source and storm water discharges to document compliance with NPDES permits; therefore, the Environmental Monitoring Branch has primary responsibility. However, responsibility for maintaining compliance is assigned to the organization having operational responsibility for the unit causing the emission.

The CWA authorizes EPA to issue regulations governing disposal of sewage sludge. NPDES permits are required for disposal of sewage sludge that could result in any pollutant entering navigable waters. As the organization responsible for managing the Rocky Flats sewage treatment system, the Waste Management Branch is responsible for compliance with this portion of the CWA.

- Comprehensive Environmental Response, Compensation, and Liability Act - CERCLA provides the statutory basis for identifying, evaluating, and remediating sites where hazardous substances have been released or pose a substantial threat of release. Title III of the Superfund Amendments and Reauthorization Act (SARA Title III) has been codified as a separate legislative program and is covered under the Emergency Planning and Community Right-To-Know Act (EPCRA).

  The remaining sections of CERCLA established the requirements for spill reporting and site remediation. The requirements for spill reporting would be included in the response plan prepared by the organization responsible for the hazardous or toxic chemical. All activities required for site remediation that are carried out under CERCLA, except post-remediation groundwater monitoring, are the responsibility of the Environmental Restoration Division.

  Groundwater monitoring, if required for long-term monitoring of a remediated site, is the responsibility of the Environmental Monitoring Branch. All groundwater monitoring in support of remedial activities is the responsibility of the Environmental Restoration Division.

  CERCLA and SARA govern Superfund investigative and remedial activities at abandoned hazardous waste sites. Rocky Flats has been added to the Superfund National Priorities List, where CERCLA sites are grouped according to location and potential health risk.

- DOE Orders - DOE Orders are regulations promulgated by Headquarters. All operations at the site are conducted in accordance with DOE Orders, which describe requirements for activities performed by DOE and its contractors. DOE Orders that drive specific FYP activities are:

- DOE Order 5820.2A, Radioactive Waste Management, which drives all waste management activities included in the FYP.

- DOE Order 5400.1, General Environmental Protection, which is shown as a driver for the "Upgrade Radioactive Stack Sampling" (ADS #83) FYP activity.

- DOE Order 5400.XY, a series of Orders that addresses radiation protection for the public and the environment.

- DOE Order 5480.3, Safety Requirements for the Packaging and Transportation of Hazardous Materials, Hazardous Substances, and Hazardous Wastes, which is a driving requirement for "Incineration Alternatives for Combustible Waste" (ADS #4111) and "Nitrate Destruction System" (ADS #3302B) FYP activities.

• Emergency Planning and Community Right-To-Know Act - This act is the free-standing legislative program resulting from SARA Title III requirements. It encourages and supports community planning efforts at the state and local levels and provides citizens and local governments with information regarding chemical hazards present in the community.

EPCRA includes four major requirements for facilities:

- Facility owners and operators must notify the state planning commissions if the facility contains extremely hazardous substances in excess of the threshold planning quantities specified in EPCRA.

- Facility owners and operators are required to immediately notify state and local emergency planning commissions of releases of hazardous substances in excess of reportable quantities.

- Facility owners and operators must submit MSDSs or a list of MSDSs for hazardous chemicals or substances to emergency planning commissions and fire departments. The type, location, hazard, and amounts of material present must be reported.

- Certain facility owners and operators must provide an annual report of all releases of toxic chemicals.

The primary responsibility for reporting under EPCRA has been assigned to the Environmental Monitoring Branch of DOE/RFO.

- Endangered Species Act - The Endangered Species Act provides for designating and protecting wildlife, fish, and plant species that are in danger of becoming extinct and for preserving the ecosystems on which such species depend. The requirements generally involve preparation and submittal of a biological assessment to identify any endangered or threatened species that are likely to be affected by a proposed action.

  This action is most likely to occur during evaluation of the environmental impact of a pending decision or action; therefore, responsibility is assigned to the Environmental Restoration Division of DOE/RFO.

- EO 11990 - Protection of Wetlands, Executive Order 11990, states that all federal agencies must avoid, to the extent possible, the adverse impacts of destroying or modifying wetlands and to avoid direct or indirect support of new construction in wetlands if there is a practicable alternative. Compliance with this act is most likely to be of concern during evaluation of the environmental impact of a pending decision or action; therefore, responsibility is assigned to the Environmental Restoration Division of DOE/RFO.

- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) - FIFRA establishes a product registration, labeling, and review process for all pesticides produced and distributed for use in the United States. Most parts of FIFRA mandate requirements for manufacturing, registering, selling, and distributing pesticides. In most cases, DOE requirements would be limited to regulations for disposal and storage of pesticides and pesticide containers for application of restricted pesticides.

  Compliance with FIFRA regulations is the responsibility of the Rocky Flats organization managing application of the pesticides. Within DOE/RFO, the Environmental Monitoring Branch has primary responsibility for compliance.

- Federal Land Policy Management Act - The Federal Land Policy Management Act establishes public land policy and guidelines for administering the land policy and provides for management, protection, development, and enhancement of public lands. If DOE needs to use, obtain, or develop federally owned lands, it must obtain permission from the Department of the Interior.

  This action is most likely to occur during evaluation of the environmental impact of a pending decision or action; therefore, responsibility is assigned to the Environmental Restoration Division.

- Fish and Wildlife Coordination Act - The purpose of the Fish and Wildlife Coordination Act is to ensure that fish and wildlife resources receive equal

consideration with other values in planning development projects that affect water resources. Federal agencies must consult with the U.S. Fish and Wildlife Service whenever an agency plans to conduct, license, or permit an activity involving impoundment, dispersion, deepening, control, or modification of a stream or body of water.

This action is most likely to occur during evaluation of the environmental impact of a pending decision or action; therefore, responsibility is assigned to the Environmental Restoration Division of DOE/RFO.

- Hazardous Materials Transportation Act (HMTA) - The principal objective of HMTA is to promote protection of human health, property, and the environment against the inherent dangers associated with transport of hazardous materials. The regulations promulgated under HMTA establish procedures for handling, packing, labeling, placarding, and routing hazardous material shipments.

  Within DOE, only the Waste Management Branch requires routine shipment of materials covered by HMTA (usually radioactive waste) and is assigned responsibility for complying with this act for waste management activities. (It should be noted that a "hazardous material" under HMTA is not the same as a "hazardous waste" under RCRA.) The only exception would be hazardous materials/wastes resulting from remediation of a contaminated site. In this case, compliance with HMTA is the responsibility of the Environmental Restoration Division of DOE/RFO.

- Historic Sites Act - The Historic Sites Act provides for preservation of historic American buildings, objects, and antiquities of national significance. Compliance with this act is most likely to be of concern during evaluation of the environmental impact of a pending decision or action; therefore, responsibility is assigned to the Environmental Restoration Division of DOE/RFO.

- Medical Waste Tracking Act (MWTA) - MWTA establishes requirements for packing, storage, transportation, and disposal of medical wastes (cultures, stocks, human blood and blood by-products, and sharps). As a waste management activity, compliance with MWTA is the responsibility of the Waste Management Branch of DOE/RFO.

- Migratory Bird Treaty Act - The Migratory Bird Treaty Act affords protection to many species of migratory birds by prohibiting the hunting or possession of such species or their nests or eggs. Consultation with the U.S. Fish and Wildlife Service is required regarding impacts to migratory birds and methods to avoid or minimize these effects.

Compliance with this Act is most likely to be of concern during evaluation of the environmental impact of a pending decision or action; therefore, responsibility is assigned to the Environmental Restoration Division of DOE/RFO.

- National Historic Preservation Act - The National Historic Preservation Act requires that any federal agency, before undertaking any project, adopt measures to mitigate the potential adverse effects of that project on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places. This action is most likely to occur during evaluation of the environmental impact of a pending decision or action; therefore, responsibility is assigned to the Environmental Restoration Division of DOE/RFO.

- National Trails System Act - The National Trails System Act establishes a system of recreational trails in order to provide a variety of outdoor recreation uses in or reasonably accessible to urban areas. Federal agencies must evaluate planned projects for impacts to established or proposed trails, including state and local trails of importance.

  Compliance with this act is most likely to be of concern during evaluation of the environmental impact of a pending decision or action; therefore, responsibility is assigned to the Environmental Restoration Division of DOE/RFO.

- Noise Control Act - Although the Occupational Safety and Health Administration (OSHA) has primary responsibility for controlling most noise sources in the environment, EPA has been given statutory authority to oversee federal actions concerning noise pollution in general. The Noise Control Act provides for establishment of noise standards and regulating noise emissions from products in commerce.

  Although it is not anticipated that any activity at Rocky Flats will produce ambient noise levels covered by the Noise Control Act, certain activities (such as construction) may require monitoring to demonstrate compliance with the spirit of the Act and with state and local noise abatement regulations. The Environmental Monitoring Branch of DOE/RFO is assigned responsibility for ensuring compliance.

- Occupational Safety and Health Act - OSHA requirements pertaining to hazardous waste operations and emergency response are set forth in Title 29 of the Code of Federal Regulations (CFR). OSHA requires that a safety and health program be developed and implemented for employees involved in hazardous waste operations. The program must include formal training for

supervisors and employees who work at hazardous waste sites or treatment/storage/disposal facilities, including those involved in hazardous materials spill response. The Permitting and Compliance program is responsible for providing this training.

OSHA and EPA have established a cooperative agreement in which the two agencies can better enforce occupational safety and health regulations at facilities that are regulated by both organizations.

- Resource Conservation and Recovery Act - RCRA, promulgated in 1976, and amended by HSWA, regulates generation, storage, treatment, and disposal of hazardous wastes, including mixed wastes. The State of Colorado has been granted regulatory authority for RCRA activities and has adopted the Colorado Hazardous Waste Regulations (CHWRs). The CHWRs closely parallel the RCRA requirements set forth in 40 CFR Parts 260 through 268 but are somewhat different from the permitting requirements set forth in 40 CFR Part 270.

  CDH has primary regulatory authority for RCRA activities at Rocky Flats, but EPA maintains the right to regulate RCRA activities. EPA and CDH have regulatory authority over LDR materials and enforce HSWA and FFCA requirements for these materials.

  RCRA and associated regulations drive many FYP activities related to program management, permit preparation, closure of inactive facilities that contain hazardous materials, waste storage, and waste treatment.

- Safe Drinking Water Act (SDWA) - The purpose of SDWA is to protect drinking water supplies by establishing contaminant limitations and enforcement procedures. The State of Colorado has adopted regulations requiring that water supplies be monitored and that periodic reports be submitted to demonstrate compliance with applicable regulations. The State of Colorado has also adopted regulations governing subsurface emplacement of fluids by well injection.

  Requirements under SDWA consist of inspection, monitoring, record keeping, and reporting to demonstrate compliance with primary and secondary drinking water standards. Responsibility for SDWA is assigned to the Environmental Monitoring Branch of DOE/RFO.

- Solid Waste Disposal Act (SWDA) - SWDA and the Colorado Solid Waste Regulations set forth requirements for design, construction, operation, maintenance, and closure of solid waste landfills. Because the site's solid waste landfill is a waste management facility, primary responsibility for

compliance with SWDA is assigned to the Waste Management Branch of DOE/RFO.

- Toxic Substances Control Act (TSCA) - TSCA establishes requirements to protect human health and the environment from unreasonable risks arising from the manufacture, distribution, use, or disposal of substances containing toxic chemicals. The principal sections of TSCA apply to the manufacture and distribution of new substances or new uses of existing substances and the use of asbestos in schools.

  The primary Rocky Flats compliance requirements pertain to the use, storage, marking, and disposal of polychlorinated biphenyls (PCBs) and with asbestos abatement projects. The principal contact with PCBs is through storage and disposal of discarded PCB transformers and capacitors; therefore, TSCA compliance is assigned to the Waste Management Branch of DOE/RFO.

- Colorado Hazardous Waste Regulations - CHWRs are promulgated by the State of Colorado to parallel RCRA regulations. Under CHWRs, the State of Colorado has RCRA regulatory authority (for additional detail, refer to the RCRA discussion).

- Colorado Water Quality Control Commission (CWQCC) Regulations - The CWQCC adopted temporary standards in July 1989 for Walnut Creek and Woman Creek that require extensive sampling and analysis of final holding ponds prior to discharge. In March 1990, the CWQCC finalized new drinking water standards that are much more restrictive than existing standards regarding radionuclide and organic contaminant levels.

- Draft RCRA Part B Permits - CDH has issued a Draft RCRA Part B permit for some of the facilities included in the site's Part B permit application for hazardous and low-level mixed waste. Rocky Flats must comply with the interim status regulations until the draft permit is final, at which time permit regulations will apply. CDH issued a Notice of Intent to Deny (NOID) stating that it intends to deny Part B permits to several facilities addressed in the Rocky Flats Part B permit application for hazardous and low-level mixed waste. A revised RCRA Part B permit application was submitted to CDH to resolve issues noted in the NOID; the revised permit application is currently under review. If Part B permits are not granted, these facilities will not be able to operate, will lose interim status, and will have to undergo closure under RCRA.

  The Part B permit application for TRU-mixed waste was also submitted to CDH; it is also currently under review. Efforts are under way to prepare Part B permit applications for mixed residues.

- Underground Storage Tank (UST) Regulations - Federal and state UST regulations set forth requirements for design, construction, and operation of USTs used to store regulated materials (including petroleum-based lubricants and solvents). Materials classified as hazardous waste under RCRA are excluded from control under the UST regulations.

  As the Waste Management Branch has the only potential for applying UST regulations and applies similar requirements to RCRA storage units, it has primary responsibility for Rocky Flats compliance with UST regulations.

  If groundwater is used as a method of release detection, the Environmental Monitoring Branch would be responsible for the monitoring program. The Environmental Restoration Division would be responsible for remediation of any contaminated UST sites.

- Waste Isolation Pilot Plant - WIPP, located in Carlsbad, New Mexico, will accept TRU and TRU-mixed waste in accordance with the facility's waste acceptance criteria. Because Rocky Flats does not generate remote-handled TRU waste (RH-TRU), criteria for acceptance of RH-TRU do not apply. Packages generated by the SARF/TRU Waste Shredder (TWS) will meet the following WIPP criteria:

  - WIPP-DOE-069, TRU Waste Acceptance Criteria for the Waste Isolation Pilot Plant

  - WIPP-DOE-114, TRU Waste Certification Compliance Requirements for Acceptance of Newly Generated Contact-Handled Wastes to be Shipped to the WIPP

  - WIPP-DOE-120, Quality Assurance Requirements for Certification of TRU Waste for Shipment to the WIPP

  - WIPP-DOE-137, TRU Waste Certification Compliance Requirements for Contact-Handled Wastes Received from Storage for Shipment to the WIPP

  - WIPP-DOE-157, Data Package Format for Certified Transuranic Waste for the WIPP

- Nevada Test Site Waste Acceptance Criteria - The waste acceptance criteria for the Nevada Test Site are presented in NVO-325, "Nevada Test Site Defense Waste Acceptance Criteria, Certification, and Transfer Requirements." The Nevada Test Site is approved for disposal of low-level

radioactive and low-level mixed waste and for interim storage of TRU waste. Nonradioactive hazardous waste and TRU-mixed waste will not be accepted for storage or disposal.

APPENDIX D

DOE INFORMATION REPOSITORIES

DOE INFORMATION REPOSITORIES

The Community Relations group of EG&G operates the Rocky Flats Public Reading Room ("Reading Room") for the DOE.

The Reading Room is one of five information repositories established to ensure public access to unclassified information about environmental restoration activities at the Rocky Flats Plant. Of these facilities, only the Reading Room and the Boulder Public Library employ full-time librarians and operate during the evening.

Services and Equipment

The Reading Room offers several ways for members of the public to obtain information.

People who would like assistance can consult a full-time librarian with access to a computerized bibliography and abstracts. In addition, because the Reading Room's stacks are open, members of the public may look for documents on their own. Documents are organized according to a simple, color-coded system described below. Members of the public may also perform computer-based text searches on their own. Community Relations is planning to develop a tutorial specifically for this application, for those unfamiliar with FileMaker software.

All catalogued documents must remain in the Reading Room (no checking out allowed). However, people are welcome to make photocopies to take with them. They may photocopy up to 200 pages free of charge, and the cost is five cents per page thereafter.

Lastly, a microfiche reader and a microfiched copy of documents contained in the Administrative Record was made available in FY91. The Administrative Record consists of those documents pertinent to the selection of a response action.

Documents in the Reading Room

The Reading Room contains a variety of documents pertaining to Rocky Flats. Some of these are legally required under the IAG. DOE and EG&G have also made available references that explain or otherwise complement such documents, as well as documents that members of the public have requested.

The list of present holdings is updated each month by the librarian. Free copies of the list are available in the Reading Room.

Documents Required by the IAG

- RCRA Facility Investigation/CERCLA Remedial Investigation Work Plans (Draft and Final)
- RCRA Facility Investigation/CERCLA Remedial Investigation Reports (Draft, All Phases, and Final)
- RCRA Corrective Measures Study/CERCLA Feasibility Study Reports (Draft, All Phases, and Final)
- CERCLA Proposed Remedial Action Plan (Draft and Final)
- Interim Measures/Interim Remedial Action Plans and Decision Documents(Draft, Proposed, and Final)
- Responsiveness Summaries
- RCRA Corrective Action Decisions/CERCLA Records of Decisions (Draft and Final)
- RCRA Corrective Design/CERCLA Remedial Design Plans
- RCRA Corrective Design/CERCLA Remedial Design Work Plans
- Community Relations Plans
- Sampling and Analysis Plans
- Plan for Prevention of Contaminant Dispersion
- Background Study Plan
- Treatability Study Plan
- Work Plan to Implement Discharge Limits for Radionuclides
- Interim Measures/Interim Remedial Action Implementation Document and Certification of Completion
- Historical Release Report
- Monthly Progress Reports
- Health and Safety Plan
- Baseline Risk Assessment Technical Memoranda
- RCRA Corrective Measures Study/CERCLA Feasibility Study Technical Memoranda
- RCRA Facility Investigation/CERCLA Remedial Investigation Workplan Technical Memoranda
- Priority Proposal for Operable Units No. 3, 5, 6, 8, 12, 13, 14, 15, and 16

Catalog System

Under the Reading Room's catalog system, color-coded labels identify three broad categories of documents.

Yellow labels denote text from news media. These records include news clippings from January 1989 to the present, journal articles, symposia reprints, and press releases.

Serials are indicated by blue labels and cover many types of periodically issued items such as environmental monitoring reports, findings from oversight committees, the plant newspaper, and the plant policy manual.

Red labels designate reports. The first two numerals shown on each label tell what year the report was issued. As with serials, reports span a variety of subjects, including investigations, soil surveys, environmental impact statements, health studies, RCRA permit applications, sampling and analysis plans, and transcripts of public meetings.

An authorized classifier reviews and approves all documents for public reading, as no classified or unclassified nuclear information (UCNI) materials are allowed in the Reading Room. In some cases, however, a non-classified version of a classified document is produced for public use.

The locations and hours of the Reading Room and the four other public repositories are listed below:

Location of DOE Information Repositories

The following information repositories contain current information, technical reports, and reference documents on environmental restoration at the Rocky Flats Plant (the final draft will include a more in depth description of the materials available at the public reading room and repositories):

DOE Rocky Flats Public Reading Room
Front Range Community College
3654 West 112th Avenue
Level B, Center of Building
Westminster, Colorado 80030
Phone: (303) 469-4435
Hours:
Monday - Tuesday 12:00 p.m. - 8:00 p.m.
Wednesday 10:00 a.m. - 4:00 p.m.
Thursday - Friday 9:00 a.m. - 4:00 p.m.

Rocky Flats Environmental Monitoring Council
1536 Cole Boulevard, Suite 150
Denver West Office Park, Building 4
Golden, Colorado 80401
Phone: (303) 232-1966
Hours: By Appointment

Colorado Department of Health
Hazardous Materials and Waste Management Division
4210 E. 11th Avenue, Room 351
Denver, Colorado 80220
Phone: (303) 331-4830
Hours: Monday - Friday 8:00 a.m. - 5:00 p.m.

Environmental Protection Agency Region VIII
Administration and Records
999 18th St., Suite 500
Denver, Colorado 80202
Phone: (303) 293-1807
Hours: Monday - Friday 7:30 a.m. - 4:30 p.m.

Boulder Public Library
1000 Canyon Boulevard
Boulder, CO 80302
Phone: (303) 441-3100
Hours: Monday - Thursday 9:00 a.m. - 9:00 p.m.
Friday - Saturday 9:00 a.m. - 6:00 p.m.
Sunday 12:00 p.m. - 6:00 p.m.

APPENDIX E

GLOSSARY

GLOSSARY

Acid	-	A chemical compound that yields hydrogen ions when dissolved in water
Actinide	-	Any of a series of chemically similar, mostly synthetic radioactive elements with atomic numbers ranging from 89 (actinium) through 103 (lawrencium)
ADM	-	Action Description Memorandum
ADS	-	Activity Data Sheet
AIP	-	DOE/CDH Agreement in Principle
AIR-DOS	-	Air Disk Operating System
AL	-	Albuquerque Operations Office
Alluvium	-	Sediment deposited by flowing water, as in a river bed, flood plain, or delta
Ambient	-	Surrounding or encircling
ANSI	-	American National Standards Institute
APEN	-	Air Pollution Emission Notice
AQCC	-	Air Quality Control Commission
Aqueous	-	Pertaining to, similar to, containing, or dissolved in water, or formed from matter deposited by water
ARAR	-	Applicable or Relevant and Appropriate Requirement
ASME	-	American Society of Mechanical Engineers
ASRF	-	Advanced Size Reduction Facility
Assay	-	The weight (%) of nuclear material in a given item

Base Programs	-	Environmental and waste management programs which are ongoing and are necessary for day-to-day operation of Rocky Flats. Base program activities are funded by DOE/DP.
Baseline	-	A time-phased budget plan against which performance is measured; formed by budgets assigned to scheduled cost accounts and the applicable indirect budgets
Bedrock	-	Solid rock that underlies all soil, sand, clay, gravel, and loose material on the earth's surface
Bench Scale	-	A mock-up or small-scale design of a plant or process
Berm	-	A narrow ledge or shelf, along a slope
Beryllium	-	A lightweight, corrosion-resistant, rigid, steel-gray metallic element with a high melting point
Bias	-	(1) The difference between the expected value of an estimator and the true value being estimated (2) A persistent or systematic error that remains constant over a series of replicated measurements
Biota	-	The animal and plant life of a particular region considered as a total ecological entity
BOD5	-	Biological Oxygen Demand
CA	-	Corrective Activities
CAA	-	Clean Air Act
CAD	-	Corrective Action Decision
CAER	-	Clean Air Environmental Reporting
CAQCC	-	Colorado Air Quality Control Commission
Caustic	-	Capable of burning, corroding, or dissolving by chemical action
CBOD5	-	Carbonaceous Biological Oxygen Demand
CDH	-	Colorado Department of Health

Centrifuge	-	An apparatus consisting essentially of a compartment spun about a central axis to separate contained materials of different density
CERCLA	-	Comprehensive Environmental Response, Compensation and Liability Act
CFR	-	Code of Federal Regulations
CH	-	Contact Handled
Characterization	-	Description of the properties or attributes of an item, process, or service
CHWA	-	Colorado Hazardous Waste Act
CHWR	-	Colorado Hazardous Waste Regulations
CML	-	Critical Mass Laboratory
Compliance	-	Act of complying with rules, regulations, or orders
Curie	-	A unit of radioactivity, the amount of any nuclide that undergoes exactly 37 billion radioactive disintegrations per second (CI)
CWA	-	Clean Water Act
CWQCC	-	Colorado Water Quality Control Commission
CX	-	Categorical Exclusion
CYWP	-	Current-Year Work Plan
Decommission	-	Take out of service, as in a nuclear plant or facility
Decontamination	-	Reduction or removal of contaminating radioactive material from a structure, area, object, or person; may be accomplished by (1) treating the surface to remove or decrease the contamination or (2) letting the material stand so that the radioactivity is decreased as a result of natural decay
DOD	-	U.S. Department of Defense
DOE	-	U.S. Department of Energy

DOE/DP	-	U.S. Department of Energy, Defense Programs
DOE/EM	-	U.S. Department of Energy, Office of Environmental Management
DOE Orders	-	5400.1 General Environmental Protection Program
	-	5480.3 Safety Requirements for the Packaging and Transportation of Hazardous Materials, Hazardous Substances, and Hazardous Wastes
	-	5820.2A Radioactive Waste Management
DOE/OTD	-	U.S. Department of Energy, Office of Technology Development
DOE/RFO	-	U.S. Department of Energy, Rocky Flats Office
DOT	-	U.S. Department of Transportation
EA	-	Environmental Assessment - A detailed statement prepared by an organization for its own use to appraise the effect of a proposed project on the aggregate of social and physical conditions that influence a community or ecosystem
EC	-	Environmental Checklist
Effluent	-	An outflow or discharge of waste, as from a sewer
EIS	-	Environmental Impact Statement - A document prepared by industry or a political entity on the environmental impact of its proposals for legislation and other major actions significantly affecting the quality of the human environment; used as tools for decision making and required by NEPA
Electrolysis	-	Chemical change, especially decomposition, produced in an electrolyte by an electric current
EM	-	Environmental Management (i.e., Environmental Restoration and Waste Management)
EMA	-	Environmental Monitoring and Assessment
EMAD	-	Environmental Monitoring and Assessment Division (EG&G RFP)

EMB	-	Environmental Monitoring Branch
EP	-	Extraction Procedure
EPA	-	U.S. Environmental Protection Agency
EPA QAMS/005/80	-	EPA document, "Interim Guidelines and Specifications for Quality Assurance Project Plans"
EPCRA	-	Emergency Planning and Community Right-to-Know Act
ER	-	Environmental Restoration
ES&H	-	Environment Safety & Health
FCWA	-	Federal Clean Water Act
FE	-	Facilities Engineering
FFA	-	Federal Facilities Agreement
FFCA	-	Federal Facility Compliance Agreement
FIFRA	-	Federal Insecticide, Fungicide, and Rodenticide Act
Fissile	-	Materials that can spontaneously fracture into lighter elements, releasing tremendous energy
FONSI	-	Finding of No Significant Impact
FS/CMS	-	Feasibility Study/Corrective Measures Study
FY	-	Fiscal Year
FYP	-	Five-Year Plan
Geologic	-	Pertaining to or related to geology, the study of the planet Earth, the materials of which it is made, the processes that act on these materials, the products formed, and the history of the planet and its life forms since its origin
Glovebox	-	A gas-tight enclosure having openings fitted with gloves, with which certain radioactive or other special materials can be safely handled

Groundwater	-	Water beneath the earth's surface between saturated soil and rock that supplies wells and springs
Gypsum	-	A white mineral used in the manufacture of Portland cement
HAES	-	Hazardous Air Emission Sampling
HEPA	-	High-Efficiency Particulate Air (a type of filter)
Heterogeneous	-	Completely different; incongruous
HMTA	-	Hazardous Materials Transportation Act
HSP	-	Health and Safety Plan
HSWA	-	Hazardous and Solid Waste Amendments
Hydrocyclone	-	A piece of equipment that uses centrifugal force to separate particles in a solution by size
Hydrogeologic	-	Relating to subsurface waters and related geologic aspects of surface waters
IAG	-	Interagency Agreement
IBC	-	Inside Building Closure
ICM	-	Interim Corrective Measure
IHSS	-	Individual Hazardous Substance Sites
IRA	-	Interim Remedial Action
In situ	-	In the original place (e.g., remediation or monitoring that occurs in place rather than collecting material for offsite treatment or analysis)
INEL	-	Idaho National Engineering Laboratory
Inert	-	Exhibiting no chemical activity; totally unreactive
Influent	-	Water, wastewater, or other liquid flowing into a reservoir, basin, or treatment plant

Inorganic	-	Not composed of organic matter
Interim	-	An interval of time between one event, process, or period and another
IRA	-	Interim Remedial Action
IRAP	-	Interim Remedial Action Plan
Isotope	-	Atoms/species of an element, having the same atomic number/ chemical element but different atomic weights
Joule melter	-	The joule melting process uses the heat generated by electrical resistance to melt waste and glass formers together into a very stable glass matrix. This process traps inorganic and metallic constituents within the matrix, while destroying the organic constituents.
LANL	-	Los Alamos National Laboratory
LCO	-	Limiting Condition of Operations
LDR	-	Land Disposal Restrictions - Waste that is restricted from disposal in a landfill because it contains material classified as hazardous
Leaching	-	Removal of soluble constituents by the action of a percolating liquid
M&O Contractor	-	Management & Operating Contractor
MAP	-	Mitigation Action Plan
MSDS	-	Material Safety Data Sheet
MWTA	-	Medical Waste Tracking Act
NAAQS	-	National Ambient Air Quality Standards
Nanocurie	-	One billionth part of a curie (abbreviated as nCi)
NCC	-	NEPA Compliance Committee
NDA	-	Nondestructive assay

NEPA	-	National Environmental Policy Act
NESHAP	-	National Emission Standards for Hazardous Air Pollutants
NOC	-	Notice of Completion
NOD	-	Notice of Deficiency
NOID	-	Notice of Intent to Deny
NOV	-	Notice of Violation
NPDES	-	National Pollutant Discharge Elimination System
NPL	-	National Priorities List
NQA-1	-	Nuclear Quality Assurance Level 1
NRC	-	Nuclear Regulatory Commission
NTS	-	Nevada Test Site
Nuclide	-	A general term referring to all known isotopes, both stable and unstable, of the chemical elements
NVO	-	Nevada Operations
NWQA	-	Non-Weapons Quality Assurance
OMB	-	Office of Management and Budget
OOC	-	Other Outside Closures
OPWL	-	Original Process Waste Lines
Organic	-	(1) Pertaining to, or derived from, a living organism (2) In chemistry, any compound containing carbon
ORR	-	Operational Readiness Review
OSHA	-	Occupational Safety and Health Administration
OTD	-	Office of Technology Development

OU	-	Operable Unit
P&S	-	Production and Surveillance
PA	-	Protected Area (formerly called PSZ)
PCB	-	Polychlorinated biphenyl
PEIS	-	Programmatic Environmental Impact Statement
Pilot Scale	-	A prototype or first run of a plant or process before full-scale production
PPCD	-	Plan for the Prevention of Contaminant Dispersion
Precipitate	-	To cause a solid substance to be separated from a solution
Promulgate	-	To put a law into effect by formal public announcement
PSZ	-	Perimeter Security Zone (now called Protected Area - PA)
PUC	-	Preliminary Unconstrained Case
PU&D	-	Proper Utilization and Disposal
Pyrolysis	-	Chemical change caused by heat
QA	-	Quality Assurance
QAA	-	Quality Assurance Addenda
QAP	-	Quality Assurance Plan
QAPjP	-	Quality Assurance Project Plan
QAPP	-	Quality Assurance Project Plan
QC	-	Quality Control
QE&C	-	Quality Engineering and Control
R&D	-	Research and Development
RAAMP	-	Radioactive Ambient Air Monitoring Program

Radioisotope	-	An unstable isotope of an element that decays or disintegrates spontaneously, emitting radiation
Radionuclide	-	A radioactive nuclide
Raschig rings	-	Small cylindrical rings fabricated from inert materials which are used at Rocky Flats for preventing criticality in tanks storing radioactive materials
RCA	-	Residue Compliance Agreement
RCRA	-	Resource Conservation and Recovery Act
RD&D	-	Research, Demonstration, and Development
RDDT&E	-	Research, Demonstration, Development, Testing, and Evaluation
Real-Time	-	Pertaining to the performance of a computer computation during the actual time that the related physical process takes place, in order that results of the computation can be used in guiding the physical process
Residues	-	Process by-products that contain radioactive materials in concentrations greater than the economic discard limit and that are recycled to recover the radioactive materials
Resource Loaded	-	In scheduling, tying resources (personnel, dollars, etc.) to actual activities within a schedule
RFEDS	-	Rocky Flats Environmental Data Base (Management) System
RFI/CMS	-	RCRA Facility Investigation/Corrective Measures Study
RH-TRU	-	Remote-Handled Transuranic Waste
RI	-	Remedial Investigation - An in-depth study designed to gather the data necessary to determine the nature and extent of contamination at a Superfund site, establish criteria for cleaning up the site, identify preliminary alternatives for remedial actions, and support the technical and cost analysis of the alternatives
RI/FS	-	Remedial Investigation/Feasibility Study
RI/RFI	-	Remedial Investigation/RCRA Facility Investigation

RMW	-	Radioactive-mixed waste
ROD	-	Record of Decision
RPP	-	Radiological & Personnel Protection
RWMC	-	Radioactive Waste Management Complex
SA #89-10-30-01	-	Settlement Agreement and Compliance Order on Consent #89-10-30-01
SARA	-	Superfund Amendments and Reauthorization Act
SARF	-	Supercompaction and Repackaging Facility
SDWA	-	Safe Drinking Water Act
Seismic	-	Subject to, or caused by, an earthquake or earth vibration
SEN	-	Secretary of Energy Notice
Slurry Wall	-	A wall made of a thin mixture of a liquid, usually water, and and any of several finely divided substances (such as cement, plaster of Paris, or clay particles)
SOP	-	Standard Operating Procedures
SOPA	-	Standard Operating Procedure Addenda
SQA	-	Software Quality Assurance
SSP	-	Site-Specific Plan
Stewardship	-	Management or oversight of a facility or the environment
STP	-	Sewage Treatment Plant
Superfund	-	Alternate term used for the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
Surface Water	-	All waters on the surface of the Earth, including fresh water, salt water, ice, and snow
SWDA	-	Solid Waste Disposal Act

SWEIS	-	Sitewide Environmental Impact Statement
SWMP	-	Surface Water Management Plan
SWMU	-	Solid Waste Management Unit (also called Individual Hazardous Substance Site)
TCLP	-	Toxicity Characteristic Leaching Procedure
TD	-	Technology Development
Throughput	-	Output or production, as of waste treatment process, over a period of time
Tiger Team Audit	-	A special assignment team dispatched by the Secretary of Energy in June 1989 to evaluate Rocky Flats' operations and practices and recommend corrective actions
TIS	-	Technology Investment Strategy
TRAC	-	Terrain Responsive Atmospheric Code
Transuranic Element	-	An element above uranium in the periodic table; i.e., with an atomic number greater than 92; all 11 known transuranic elements are radioactive and produced artificially (e.g., curium, lawrencium, and plutonium)
TRG	-	Technical Review Group
TRU	-	Transuranic waste
TRUPACT	-	Transuranic Package Transporter
TSCA	-	Toxic Substances Control Act
TSP	-	Treatability Study Plan
TSR	-	Treatability Study Report
TTPU	-	Thermal Treatment Processing Unit
UST	-	Underground Storage Tank
VOC	-	Volatile organic compound

Volatile	-	Description of any substance that evaporates readily at a relatively low temperature
VTL	-	Validated Target Level
WAC	-	Waste Acceptance Criteria
WEMS	-	Waste and Environmental Management System
WERF	-	Waste Experimental Reduction Facility
WIPP	-	Waste Isolation Pilot Plant
WIPP/WAC	-	Waste Isolation Pilot Plant Waste Acceptance Criteria
WIS	-	Waste Information System
WM	-	Waste Management
WQCC	-	Water Quality Control Commission
WRQA	-	War Reserve Quality Assurance
WSIC	-	Waste Stream Identification and Characterization
WSRIC	-	Waste Stream and Residue Identification and Characterization

APPENDIX F

RESPONSIVENESS SUMMARY FOR FY91 SITE-SPECIFIC PLAN

Comment Summary
List of Commentors
Comments and Responses

The FY91 Site-Specific Plan was issued in January 1991. A public hearing was held on April 1 at which the public and citizens' groups were invited to express their concerns and questions. The public comment period ran from February 15 through April 15, during which time people were invited to submit comments and questions in writing regarding the Site-Specific Plan. The oral and written comments that were received are answered in Appendix E. These comments have also been addressed, where possible, in this version of the Site-Specific Plan.

Comment Summary

The following is a list of the comment categories into which the comments received for the FY91 Site-Specific Plan were divided. Also listed are the number of comments pertaining to each category and the specific comment numbers which apply to each category. The following pages list the comments and responses.

Comment Category	# of Comments in Category	Comment #'s
Federal, State, and Local Regulations	22	41, 24, 26, 27, 37, 50, 65, 15, 13, 14, 34, 36, 38, 39, 40, 59, 62, 64, 66, 12, 35, 67
Funding Issues (ER Funding/Health Funding)	7	2, 30, 42, 43, 44, 33, 58
Resumption of Operations (Negative Commentary) (Plant Operations)	7	1, 77, 78, 80, 81, 87, 60
Site-Specific Plan (Comments)	7	2, 16, 17, 22, 31, 49, 84
Assumptions	5	6, 23, 25, 28, 74
Disposal issues	4	29, 68, 69, 82

Comment Category	# of Comments in Category	Comment #'s
Rocky Flats Cleanup Commission	4	7, 8, 46, 47
Technology Development (Thermal Treatment)	4	61, 70, 71, 72
Contaminant Emissions Resulting from Remediation Activities (Enclosure of Some Sort)	3	4, 18, 56
Monitoring of Rocky Flats	3	86, 5, 53
Technical Review Group	3	3, 19, 52
Contaminated Ducts/Criticality Lab	2	75, 76
Dam Reinforcement at Ponds Water Retention Structures (Safety of Dams?)	2	9, 54
Performance Measurement System (QA)	2	48, 73
Prioritization System/Plant	2	32, 45
Waste Stream Identification	2	10, 57
NEPA Documentation	1	83
Recycle Water	1	11
Safety & Health of Workers	1	85
Waste Minimization	1	79

List of FY91 SSP Commentors

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Front Range Alternative Group
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No phone number available

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(303) 298-8001

Marcia S. Bryant
[redacted]

Mildred Mulligan
[redacted]

Comments on the FY91 Site-Specific Plan

The following comments were transcribed at the public comment meeting and have not been edited.

COMMENTOR: Barb Moore, Front Range Alternative Action Group

Comment 1

This Site-Specific Plan stated that its first priority is to prevent near-term adverse impacts. I would strongly suggest that resuming plutonium operations at Rocky Flats would adversely affect the environment out there. I do not believe there is any way to restart Rocky Flats plutonium operations without adversely impacting the environment. The corrective actions must include the removal of all plutonium in the duct work, in the piping systems, and in and around the grounds and the soils of Rocky Flats.

I want to emphasize that any funding that is budgeted for environmental management should not be spent on resumption operations or plutonium operations.

Response 1

The process leading to the resumption of operations has been designed to ensure that resumption activities will not have a detrimental effect on the environment at or surrounding the plant. Resumption of plant operations will not occur until all relevant safety issues have been corrected and resolved.

Corrective Activities, currently funded by DOE/EM are activities necessary to bring active and standby facilities into compliance with regulations and agreements pertaining to air, surface water, and groundwater. Resumption activities (facility and procedural upgrades required prior to resumption) are under a totally separate program from the Corrective Activities. The funding for these two types of activities comes from separate DOE programs and is non-transferrable. Funds budgeted for the ER&WM program will not be spent on resumption activities.

Comment 2

On page 1-20, Paragraph 4, it mentions a performance measurement system that is being developed to report actual performance against plan and budget schedule. We're interested in viewing this budget and schedule and we would like this to be available to the public as soon as it is prepared. There is a particular problem that comes to light when you review the budgets section beginning on page 1-20. By the time we review a document such as Site-Specific Plan for year 1991, all the important input from the public comment and the

decisions have already been made. So, it is more or less futile for us to be doing this, other than we may have an impact in '92. We would like to have an impact for the year we are speaking on.

Response 2

Planned budgets and schedules are contained in the FYP and are available for public review and comments. The FYP covers proposed activities for the five year period starting two years from the current fiscal year. The current year's funding and schedules are included primarily for reference. Public comment on the FYP is solicited every year and will have an impact on the future year's activities for which funding has not yet been allocated. DOE recognizes the need for the public's review and comments prior to the implementation of these plans, therefore, the FY92 SSP is being issued prior to the start of the fiscal year to provide ample opportunity for public comments.

Comment 3

On page 3-7, we are talking about a technical review group. We would like to know when this technical review group will be formed, who will be involved with it, and what is the selection process. We would strongly suggest that you take a public opinion poll on who should be on that technical review group so we can have participants from the public.

Response 3

The technical review group (TRG) for Environmental Restoration Work Plan Scoping and Review was formed in May 1991 and held its first meeting on June 11, 1991. It is the Department of Energy's position that the TRG needs to reflect the widest spectrum of the public possible while maintaining a sound technological basis. A public opinion poll would not have fielded the same results, so it was not used to determine participation. Instead DOE, EPA, and CDH identified groups that had the necessary technical expertise and would represent a broad spectrum of viewpoints. Each of these groups was invited to designate a member. In addition, two ad hoc positions may be filled on a temporary basis by experts from universities, industry, or other agencies who could assist the TRG with their reviews on specific topics.

Current membership of the TRG includes representatives from the Rocky Flats Environmental Monitoring Council; Rocky Flats Cleanup Commission; Citizens Against Nuclear Disinformation in Denver; local governments; and technical staffs from DOE, EG&G, EPA, and the State of Colorado.

Citizens who are interested in environmental restoration activities are encouraged to contact TRG members. Comments on documents under review by the TRG should be forwarded to TRG members for consideration.

Comment 4

There is talk about contaminant dispersion, PPCD, and we again would strongly suggest, as it has been suggested many times at other public hearings, that all remediation activities take place that are going to disturb the soil in any way, those activities must take place under an enclosure of some sort. That is to prevent the contaminations from being dispersed out into the communities.

Response 4

Areas that may be disturbed due to intrusive RI/RFI or IRA construction activities will be characterized and the potential hazards evaluated prior to work activities. Appropriate precautions to protect workers and the public are taken based on the results of these evaluations. Appropriate precautions may include, but are not limited to, implementation of site and activity specific work practices, dust control measures, and monitoring.

Comment 5

There is mention on page 3-23 under Radiological Ambient Air Monitoring that there will be more samplers put in place. We would like to have public input on where those monitors are going to be placed, the locations of them, where do we want them as far as do we want them five feet from the ground or do we want them 20 feet up in the air. You do need to talk to the community about this. As it is now, the monitors in many people's minds are not adequate. And so, in order to correct that problem and to comfort the community, we need to have input on where these are going to be.

Response 5

Ambient air monitors are placed in locations that will effectively sample ambient air. The decision as to where to place monitors is made by technical specialists and is based on meteorological, thermodynamic, and particle behavior factors. The opportunity for public input will be afforded when the Air Quality Management Plan is released for public comment in July 1991. The plan includes discussion of the RAAMP program.

COMMENTOR: Joe Tempel, Rocky Flats Cleanup Commission

Comment 6

I would like to start off with questioning a key assumption that was stated back in Chapter 7 and that assumption is that the federal policies will remain the same through 1997. And, this means that there will be certain upgrades and long-term maintenance plans for longer term uses at the plant. And I'm concerned in light of the modernization report where two

out of the three alternatives recommend moving Rocky Flats, that this remains as a key assumption recognizing that when this report came out that modernization study wasn't available. But clearly it should be reflected in the '92 plan that this assumption probably cannot be made with good consciousness because things -- the modernization report should be done -- EIS should be done in '93 or '94 and other actions should be occurring at least by '97. So that assumption shouldn't carry on to the next report.

Response 6

The FY92 Site-Specific Plan is based upon current DOE assumptions about operations at the Plant. If the decision is made to change the mission of the Plant, an EIS on reconfiguration will be required and will take approximately three years to complete. ER&WM activities required for reconfiguration will then be identified in subsequent Five-Year and Site-Specific Plans.

Comment 7

I feel that the Rocky Flats Cleanup Commission should be mentioned along with the other organizations identified as having environmental input. Let me -- it says, "Other external organizations are also involved in environmental activities. They include DOT, OSHA, CDH, the Governor's Panel on Monitoring Systems, Rocky Flats Environmental Monitoring Council." I would say for the amount of testimony you can comparatively hold in the hand, we rate at least equally with those other groups there. So, we would appreciate it in the next update that you include our name there, as well.

Response 7

The government agencies and organizations that are listed are set up by the Governor's office and have direct regulatory or oversight responsibilities for Rocky Flats environmental activities. Many public interest groups contribute their views to Rocky Flats public meetings and forums, and this involvement has been incorporated into the Rocky Flats Community Relations Plan. DOE is committed to involving the public in planning and implementation of environmental initiatives beyond statutory requirements.

Comment 8

On page 19, there's some discussion about the public relations and community involvement plan. We again would like to make a pitch to be able to contribute articles to the environmental update that the DOE puts out every other month. We asked for this numerous times and will continue to ask for it in these forums. We feel we have a voice and a perspective to contribute and we'd like to engage in the dialogue in that forum as well as these forums. We feel it's valuable for the better product at the plant.

Response 8

Community interest groups have several ways to put views forward including public meetings and comments on Rocky Flats activities. Several community interest groups have newsletters which are disseminated to the community. The purpose of the bimonthly environmental update published by DOE is to provide status on ER&WM activities, not to provide a forum for public debate.

Comment 9

I would like to read a couple of damning statements from the document related to the retention ponds. In Chapter 3, page 26, there's a statement that "long-term retention in the ponds cannot be met without creating an unsafe condition" and then later on it says, "this retention is needed in order to meet the CDH's water quality standards". On the next page, 27, it says, "existing data and water treatment approaches are inadequate to assure pond releases will continue to meet standards". This concerns me that the dams aren't stable enough and that the standards may not be met this year. I'll just issue that as a challenge to stabilize the dams and make sure those standards are met when you release from the ponds.

Response 9

Retention in the ponds is necessary for proper sampling in order to comply with the Agreement in Principle. The problems associated with long-term retention in the ponds and the resulting potentially unsafe condition of the dams are currently being studied by the U.S. Army Corps of Engineers. Ongoing stabilization work is also ongoing by the U.S. Army Corps of Engineers. If an actual unsafe situation is detected, appropriate corrective actions will be implemented.

Rocky Flats is addressing the concern about releases meeting standards by continuing to characterize water-borne contaminants and contaminant sources, refining treatment technologies, and improving its analytical techniques. Every effort will be made to assure that no discharge of water from the Rocky Flats ponds will occur without ensuring that the water quality is in compliance with the NPDES permit limitations and the Agreement in Principle, which requires CDH concurrence as to the safety of the water before its discharge.

Comment 10

In Chapter 4, you talk about a task where you want to characterize the waste stream. Our concern is that this characterization is done more by analyzing the process rather than the wastes themselves. We feel more effort should be made to characterize the wastes rather

than doing the chemical equations to try to figure out what should be coming out the tail end of these production processes.

Response 10

EG&G agrees with the commentor and in fact has been working toward full analytical characterization since the most recent characterization effort began in June of 1989.

A few points of clarification are necessary for the commentor's information. First, EPA-approved waste characterization methods (as described in SW-846) were developed based on analysis of non-radioactive waste. The methods are very straight forward in this context. However, when dealing with radioactively contaminated waste samples, a variety of personnel protection concerns must be addressed, and delicate operations must be performed from outside a glovebox, using leaded gloves.

Second, it has been discovered through testing that analysis of highly radioactive samples are not compatible with current EPA approved methods. For example, the radioactive contamination (Pu) can actually interfere with the RCRA analyte of interest (heavy metals) because Pu spectra overlap with the emission spectra of other metals.

Third, RCRA and the Colorado Hazardous Waste Act do not require analysis alone, but allow for the use of process knowledge and/or analytical data.

The current waste characterization effort is being performed in a phased approach. Phase 1 includes an identification and process knowledge characterization of all wastes (and residues) and waste (and residue) generating processes. In addition to meeting regulatory requirements, it is felt that this process knowledge phase provides basic information for future analytical requirements. Phase I was completed and delivered in September 1990 and continues to undergo revision to ensure that it remains current and accurate.

Phase II provides for analysis of those streams for which proven analytical methods exist and for which radiation protection concerns do not exist (e.g., non-radioactive hazardous wastes). This effort is currently underway and analytical data are being compiled.

Phase III provides for development of new analytical methods and subsequent application of these methods to radioactive waste (and residue streams). This effort is currently underway as well. The EPA is well aware of issues associated with analysis of radioactive waste and is participating in this methodology development effort. EG&G wants to make sure that any methods developed are approved and structured by the EPA in order to provide documentable defensible data.

Comment 11

If the water is meeting standards from the treatment 881 and 903, why not recycle that water back into some process in the plant, not drinking water necessarily, but some kind of an industrial process, cleanup process, what have you, rather than dumping it into the ponds where it would be treated again or used for dilution of whatever is in the ponds? But this seems like a waste to spend all this money to treat the water and then just dump it in a stream and not use it again.

Response 11

Water that will be treated through the 881 Hillside IRA will be discharged into the C-2 Pond, and from there, via the C-2 recycle project, back into the plant's raw water intake. Water that will be treated through the 903 Pad IRA will discharge into the "B" series ponds on South Walnut Creek. Water from the "B" Ponds is piped to the A-4 Pond where it is analyzed and treated (if required) prior to discharge offsite. However, studies are currently being conducted with the aim of minimizing offsite releases of Rocky Flats surface water.

Comment 12

On page 4-22, there is little discussion on the LDRs and the regulations. Knowing when this came out that there was the original agreement and then -- to my knowledge it's been extended twice, September and I believe March. And, I think it's due to be extended in May. I think there needs to be a lot more discussion and maybe it will all be history by the time you come out with the '92, but I think it needs to be a lot of discussion on what those LDRs mean to the operation of a plant. The way I see it, there is a violation occurring now with not complying with the LDR law which basically says you can't store these hazardous wastes and you have to be in the process of disposing of them properly. I know this compliance agreement makes that a little gray on whether you're in compliance or not with the law. But the public is left in the dark on really what those negotiations are and what that means to the operation of a plant. So, next time that should be given more discussion in the document on how you comply with the LDRs other than producing reports.

Response 12

More complete discussions of the LDRs, RCA, and the FFCA are contained in Section 8. DOE and EPA have negotiated a two-year extension of the FFCA for LDRs and is currently negotiating this agreement and the RCA with CDH.

Comment 13

I previously asked a question about the low-level storage facility that's being planned for construction, whether that needed to get a RCRA permit. In the document, it says "may" and you said "will" in the question period. And, I think in any future document, the "mays" and the "wills" should be perfectly clear that those appropriate permits will be obtained. The same goes for the storage of mixed residues that the limits for those storage and the permit to store those residues need to be identified.

Response 13

We apologize for the lack of clarity regarding permitting of the low-level waste storage facility. If the facility is used strictly for low-level waste, a RCRA permit will not be required, however, all storage facilities housing hazardous or mixed wastes must and will be RCRA permitted.

Comment 14

I would recommend that any additional storage over and above the current permitted storage be for waste generated through cleanup. It's pretty clear in reading the document that these storage limits are going to be exceeded fairly soon in plutonium time. Whether WIPP opens or whether Nevada Test Site opens for the TRU-mixed waste or the low-level waste, I think it'll have a significant bearing on when your storage limits are reached. And, I would hate to see those storage limits exceeded for any production purposes.

Response 14

Rocky Flats is committed to staying within established storage limits. While the site is planning near-term disposal of wastes at WIPP and the Nevada Test Site, other options for interim storage are also being pursued. In addition, we are working to improve treatment processes, expand waste minimization efforts, and improve the overall waste management program (see Section 5).

Comment 15

In Chapter 5, you have a task on thermal treatment research and also you talk about a bench-scale burning of TRU-mixed organic sludge and a screw pyrolyzer for a removal of organics. All of these involve burning and they should obtain appropriate RCRA permits as necessary because the general public is concerned about the exposure we get to the pollutants generated from burning. Now I do have to commend you, for one task on alternatives to thermal treatment will be researched and I think that's where your money should go to allay fears from the citizens in the metro area.

Response 15

Treatment studies handling less than 1000kg of waste per year are included under a Treatability Study Exemption, which is filed with CDH. A RCRA permit is not required. These studies must also meet all requirements of the Clean Air Act.

Comment 16

I would like to recommend that the responsiveness summary be improved next time. That it's not real clear who commented. At least, I think, it's clear who commented in writing, but it's not clear who commented at the public hearing because I know we were there. But, I know you've done better responsiveness summaries and I think if you follow along with either the IAG format for the responsiveness summary or the 903 responsiveness summary, it's much clearer who made comments and how often they were made in those summaries than just kind of a generic discussion as you included in this year's '91 Site-Specific plan.

Response 16

Rocky Flats recognizes and appreciates your positive support for the IAG responsiveness summary and will use it as a model for this and other responsiveness summaries.

Comment 17

I would like to recommend that you extend the comment period to May 15 just because we're trying to get a recent set of comments on the sitewide EIS scoping and we could use a couple more weeks to finalize our formal comments on the Site-Specific Plan.

Response 17

The comment period was extended to accept your comments. Comment periods have been negotiated with EPA and CDH and provide for timely completion of documents while maintaining the minimum legal requirement. We will attempt to incorporate all comments received to the extent practicable.

Comment 18

And, I'll close with a recommendation for an enclosure, as previously mentioned. That any invasive activities, we feel, should take the maximum precautions to enclose the activity in the enclosure. Maybe you can write it in at least as a research activity to do some testing on these and how well they work and what kind of filters you need and how much protection you need of the workers. But, we still emphasize that the worst case should be considered

at the plant and that the maximum protection of the workers should be taken into consideration.

Response 18

Please refer to comment and response number 4.

Comment 19

And, finally, we would like to become a member of the technical review team that will have an opportunity to review scopes of work or work plans before they're finalized and get an early jump on some of these documents, so that we won't hold up the formal review process by the public.

Response 19

Refer to comment and response numbers 3 and 52. The FYP is also available in the Public Reading Room. The current FYP has ADSs which include requested funding, work scopes, and milestones for planned work during FY93 through FY97.

COMMENTOR: Jim Stone, Stone Environmental Engineering Services, Inc.

I'd like to start out by complimenting you on your production here. It does a good job of providing background. I have recommended it to attorneys who are beginning to become interested in the problem out there and it gives them an excellent review of the situation. However, it doesn't do much for cleaning up Rocky Flats. I have a feeling that as I review plan after plan after plan that you're determined to restart Rocky Flats. That's not my subject tonight. I will stay specifically to the topics listed primarily in this plan and that is operating unit Nos. 1 and 2. But, I think you should be cautioned that that is not going to be tolerated. Neither is the fact that you seem to be delaying the correction of imminent dangers to the workers, the public, and the environment. Now, that statement alludes directly to operating unit Nos. 1 and 2.

Comment 20

Let's take a minute and look at the geology of that site. We have a glacial moraine out of Coal Creek Canyon, groundwater migrating through it, through a lot of contaminated dump sites. That overlays a little bit of bedrock and then you have several established aquifers -- the Arapahoe, the Fox Hill, particularly. Those continue downgrade under Denver clear on into Kansas. Now, the French drain you put in provides some cosmetic protection for the existing reservoirs, surface water primarily. But, if you had spent that money

intercepting this groundwater just a few hundred feet east of the educational center, you could have dried up all of the water that's causing those pollutants to migrate further into the public domain. That's my primary concern. In the next day or two, we're going to be talking about air pollution and EIS and all the other things. But tonight, I want to emphasize the serious potential for water pollution.

Response 20

Intercepting groundwater east of the Education Center will not dry up the groundwater beneath Rocky Flats. Groundwater is recharged by precipitation and seepage of surface water from streams and ponds. Plant operations only affect the unconfined alluvial material and subcropping Arapahoe Sandstones. Plant operations in no way affect the confined Arapahoe Sandstones or the Laramie/Fox Hills aquifer.

Comment 21

If you look at the monies you've spent on the system that you've proposed, that system did not have the standard procedure for selection; that is a conceptual design, a Title I review, a Title II review, and then purchasing. You decided to pump water and the only alternatives that you proposed were how we're going to treat the water, whether we were going to treat it with activated carbon or ozone or peanut butter or what. That's not good enough. That isn't what your prime directive calls for as an alternative. An alternative is a different method like diversion or excavation. You have at least three to six mother lodes of contamination there that have to be excavated sooner or later. This would be in gold mining terms a glory hole. You can see one up in Central City if you want to see what this is going to look like out there when you get through. But, if you try to continually erode that material by the migration of groundwater, you're going to be there forever.

Now, as I said earlier, I think you want to be there forever until people get tired of talking about this subject and you get on with the manufacturing of bombs. And, we're not going to have it. We are going to ask you to look at serious alternatives. You hired these people from Houston, Halliburton. Good people, they know all about drilling, but they probably learned it at School of Mines. You are going to have to involve the 1,000 engineers that work out there in alternative solutions, in addition to the engineers in society in the Denver area. You're not doing that. You're kidding us. You're delaying. All right. Enough of that.

Response 21

The IRA for the 881 Hillside has been approved by the regulatory agencies. The IRA also went to public review several times during the approval process and concerns were addressed and/or incorporated into the IRAP. The engineering and design of the system meets the standards of the regulatory requirements at both the federal and state levels.

Comment 22

I would like for you to realize that we're looking for your basic data that your plans are based on. We don't see it. Without that, this very fine book is just rhetoric. It's just a dream, a wish list. So, we've got to have that basic data to work with. Then, you'll get some replies from the students up here at Mines and the profs at CU and the engineers in the area. But, they have nothing to work with. You look around the room here and there aren't very many engineers here. A lot of knowledgeable people, but without that basic data, engineers won't talk. I lived with it. So, I have a little bit of a leg up on that situation. You also have a habit of saying that there is no evidence that thus and such is so. Forget that. Reverse that strategy and say we worked our tail off to confirm that there never was anything there and there never can be anything there. And, if there was something there, we got rid of it and it won't happen again.

Response 22

Data used in designing IRAs and other work plans is not included in the Site-Specific Plan. This information is available in OU-specific and sitewide work plans, RI reports, closure plans, and other sitewide reports. The characterization process seeks to define contamination levels. Until each OU is completely assessed, we are not able to argue that something does not exist with 100% accuracy. Large amounts of funding and effort are being spent on characterization activities in order to ensure that remediation will not worsen the situation and will effectively eliminate the contamination problem.

Comment 23

Reverse your thinking on the standard practice of the Department of Health that says there's no evidence. And, you say, did you look? No, but there's no evidence or the wind blew it some other direction or something like that. So, reverse that thinking.

Response 23

Your advice is appreciated and will be considered. Also, please refer to comment and response #22.

COMMENTOR: Melinda Kassen, Environmental Defense Fund

The first thing I'm going to talk about isn't on there. I want to talk a little bit about the assumptions. First of all, I want to commend you for putting Chapter 7 into this plan because I think that it's revealing, to say the least. And, I think that the assumptions are overly optimistic. Both of you have certainly heard me say that before. The result of overly

optimistic assumptions is that you allow yourself to plan without coming up with backup plans and what that leads to, at least in my experience over the last four years of dealing with this plant, is that leads to crises. And, I tend to think it might be better if you revised your assumptions to be a little less optimistic.

Comment 24

7.1.3, the first bullet, "corrective activities will be completed within five years." I'm going to talk in a minute about why it is that RCRA compliance, not past action, not closure plans, but RCRA compliance, now is not a part of corrective activities. EDF certainly thinks that it should be, along with the Clean Water and Clean Air Act. If you include RCRA compliance activities in corrective activities, there is no way that you're going to be in compliance within five years.

Response 24

Corrective Activities are those activities necessary to bring the facility into compliance with existing regulations and agreements pertaining to air, surface water, groundwater, and soils. Corrective Activities do not include waste compliance activities.

Comment 25

7.1.5, Third Parties, what this says is that non-governmental groups, EDF, Sierra Club, those kinds of groups, are not significantly going to change the existing management and remediation agreements, I assume through court action. You may have to assume that for the purposes of planning, but again in terms of backup strategies, I think that Rocky Flats would be better off if you concede to the possibility that you were going to lose on some of your legal theories and get ready for it before it actually happens. When Sierra Club filed the residue lawsuit, I think that at that point it would have been appropriate for DOE to start figuring out what Plan B was going to be.

Response 25

Non-governmental groups continuously provide comments to DOE/RFO on work plans, budgets, schedules, and other decision documents. These comments are evaluated and incorporated, where applicable, into our planning process.

The outcome of legal proceedings is difficult to plan for. Time is needed to establish policy after a court decision is reached. The planning process is flexible enough that new policy can be addressed and incorporated in a relatively short period of time.

Comment 26

7.2.2, Federal regulatory compliance drivers, the third bullet talks about the FFCA addressing LDR wastes being renegotiated and then there's this statement that Rocky Flats will also need to implement compliance plan for the RCA, which is the residue compliance agreement. It's my understanding based on what Fred Dowsett said at the Rocky Flats Monitoring Council that, in fact, there will be a new residue compliance agreement and that you will have to meet those portions. Whether that's -- it's not included under state compliance agreements. That is not going -- it is my understanding that that plan is, in fact, going to take you a substantial amount of activity, particularly if it is going to require storage of the residues and compliance with all RCRA regulations.

Response 26

DOE and EPA have negotiated a two-year extension to the FFCA. The RCA is currently being negotiated with CDH. Rocky Flats will comply with all agreements.

Comment 27

Continuing in that same part assumptions, RCRA permits/interim status will be granted -- this is one of these places where Joe might suggest that you would want to reverse the "wills" and "mays" -- will be granted to all new waste treatment units as required to meet EM schedules. Final RCRA permit language will be similar to that in current permit applications and the IAG schedule will be met. Gentlemen, those are laudable goals and you can certainly hope that that's what's going to happen, but I don't think they're realistic planning assumptions. And, if this, in fact, is a planning document, I would suggest that you move along to more realistic planning assumptions.

Response 27

Please refer to comment and response number 13.

Comment 28

7.3 is called Assumptions Based on Project Requirements. There are three little bullets here which assume that funding requirements will be fully met. And, my comment here is not so much that that's maybe not an achievable goal, but that it is only going to happen if the Department of Energy requests enough money and our experience in the last two years is that, notwithstanding the commitments in the Five-Year Plan and notwithstanding all the Secretary's good words, DOE hasn't even asked for enough money to fully fund the tripartite agreement to fully fund corrective actions and to fully fund the environmental restoration obligations which they're taking on. You have got to ask for the money. If this is, in fact,

going to be an assumption, then you have to communicate that with headquarters and make sure that the funding request is consistent with this document.

Response 28

Rocky Flats does communicate all funding needs to DOE/HQ who in turn evaluates and often revises the requests before forwarding them to Congress. After funding is approved by Congress, DOE/HQ allocates these funds among the sites comprising the DOE complex, based on identified needs and priorities. The process of funding allocation is ongoing throughout a given fiscal year and includes budget reviews, activity status reports, and reassessment of needs. As needs change, adjustments in funding are made to accomplish activities and maintain consistency with the national prioritization system.

Comment 29

Finally, the assumptions regarding external support, which have to do with things like Nevada is going to stop being obstructionists and give you a permit to take waste to the low-level waste facility and that WIPP is going to miraculously open, notwithstanding all objections, again this may be what you want to have happen, but it's not an appropriate assumption for planning unless there is a Plan B. And, I don't see enough Plan Bs in here. Just to say we'll work it out without talking about how you're going to do that or what actions you're taking now to begin planning isn't enough.

Response 29

Rocky Flats uses the DOE/HQ assumption that the Nevada Test Site and WIPP will be accepting waste from Rocky Flats. Other options, such as sites in Utah for Low-level and low-level mixed wastes, are also being evaluated.

Comment 30

As another preliminary matter, there aren't very many people here. I don't think, notwithstanding the significant improvements in DOE's public relations office, that you've done a very good job in communicating to the public the importance of this document. It is true that budget matters tend to be relatively arcane, but there's all kinds of stuff in this document that I think there may be a wider public around who is interested in the substance of those documents and I would once again encourage you, as I have encouraged other people at DOE, to think about putting together some advisory panels and some focus groups to try to gain the kind of public involvement that this plan deserves because this plan, as a practical matter based on what I know about the national process on the budgeting, is critical as to whether the money is going to be there to accomplish the things that this community has very clearly said that it wants to have happen which is cleanup.

Response 30

We agree that the SSP is a very important document and we have encouraged the public to participate. Notices of public meetings are published in the Rocky Mountain News, the Denver Post, and the Boulder Daily Camera at least two weeks prior to the meeting. In addition, these notices are mailed to more than 1700 individuals and organizations on our mailing list.

We have been using a public workshop format for several public information meetings lately and plan to adopt this more interactive format for the next SSP information meeting. On the other hand, public hearings will continue to be more formal so we can gather comments on the record.

Comment 31

I think that it's great that you picked up six months and am encouraged to hear that the Site-Specific Plan in '92 is going to be out before FY92. That's a substantial improvement. It certainly is responsive to comments that I know that I made last August when you were having public comment on this plan, notwithstanding the fact that my name, as Joe's name, was not mentioned anywhere in the responsiveness summary.

Response 31

Rocky Flats is making every effort to produce documents in a timely manner and has changed the format of the responsiveness summary as requested.

Comment 32

There's a description in here of prioritization system at pages 1-7 to 1-8. That's the prioritization that was in the first national Five-Year Plan. As a member of the external review group for prioritization that met for 18 months under Leo Duffy's direction, it's my understanding that prioritization system is not being used because it was considered to be unacceptable and I was surprised to see it in this plan. DOE headquarters has spent a lot of time putting together a more sophisticated model, a multi-attribute decision making model. We happen to have a lot of problems with that model, but we were told that that model was going to be used as at least one basis for prioritizing activities at the plant site. And, certainly, to the extent that the original prioritization does not require full funding, does not require what this would call Priority 1 status for all legal requirements, we have a real problem with its appearance here and I would encourage you to communicate with headquarters about how you're supposed to be prioritizing, not just in the environmental restoration area, but I've seen a draft Federal Register notice about prioritization for waste management and, to the extent that DOE is holding out to the public that they're doing this

much more sophisticated model in a much more equitable multi-attribute decision making approach, then if it's not actually being used, it's appropriate for you to say it's not actually being used, but it's totally inconsistent with what headquarters is running around saying and that leads cynics like me to believe that it's a PR campaign.

Response 32

On your comment referring to a prioritization system which was "a more sophisticated model, a multi-attribute decision making mode" we are assuming that you are referring to the ER Risk-Based Prioritization. If so, this system prioritizes on an installation-wide basis not by activity within the site. For FY92 it will be used as a management tool and test case. Environmental restoration activities are prioritized by the IAG. They are also prioritized more broadly under the current DOE system (see Section 1.6 of the FY92 SSP). FY91 priorities for waste management activities are based on DOE's FY91 priority guidance, which is spelled out in Section 1 of this plan.

Comment 33

In terms of how DOE is selling itself to the public these days, I think it is misleading to include base environmental program costs mixed in with environmental restoration. You look at these budget numbers. Don't look at the appendix, look at the budget numbers that are in Chapter 1. And, it says we're spending $114 million on environmental restoration and base programs, but the implication is that environmental restoration is something that the Department is spending a lot of money on. If you then go back and look at the appendix and pull out environmental restoration, it turns out that you're only really spending $44 million on environmental restoration. Given how these plans get used, I think that it should be appropriate to split up base costs in a separate section so that we can actually see what's being spent on environmental restoration so that no one is misled with regard to the varying budgetary commitments that the plant is making to environmental restoration versus waste management and required costs, monitoring, for example, that's part of the permits or the AIP.

Response 33

Defense Programs, commonly referred to as Base Programs, while funded by DOE/DP, encompass a large portion of the environmental activities at Rocky Flats. DOE/DP and DOE/EM funding are listed separately in the FY92 version of the SSP. Environmental activities funded by DOE/DP include groundwater monitoring, surface water programs, and air monitoring programs.

Comment 34

Chapter 4, which talks about waste management, includes a variety of activities associated with a permitting throughout a compliance waste like the LDR and the residues, which we're not going to get into the semantics of that . You very carefully said, no, they're not wastes as far as we're concerned, but they're subject to the same requirements. Well, you've lost that in court. As far as the court is concerned, and therefore the law of the land, is that they are wastes for the purposes of RCRA. But, leaving that aside, this stuff belongs in corrective activities. I don't understand why this stuff is back in waste management getting into compliance with the LDR. You are currently out of compliance and I don't care what your Federal Facilities Compliance Agreement says, there is no such animal. That does not bring you into compliance. The existence of that agreement or any potential future agreement which would actually lay out schedules does not change the fact that you're out of compliance. You're out of compliance with that law now; therefore, all activities associated with getting into compliance should be, in my opinion, in Corrective Activities. And, the reason that that's important is because Leo Duffy has made certain commitments and whether -- I mean, we're not talking about enforceable, binding contracts, obviously -- but he has stated to the state and tribal working group and to the external review group, he has pledged, that DOE will fully fund all corrective activities. I would feel much more comfortable seeing LDR activities in that first part because that gives them a much better chance of getting funded.

Response 34

Please refer to comment and response number 24.

Comment 35

It's my understanding from conversations with various regulatory agency personnel that the plan still cannot adequately characterize its waste to determine whether it's appropriately LDR waste or not. Now, from an environmental standpoint, clearly if everything is LDR, we have more control because there are outside regulatory agencies, as opposed to just having it be pure rad waste where only DOE gets to determine whether things are safe or not. However, when large numbers of barrels of waste are categorized as LDR not based on process knowledge, but based on three samples which say methylene chloride, which is at least 50/50 chance the result of lab error and not a result of the fact that the waste has actually got that kind of stuff in it, what that says to me is that you're not doing adequate waste characterization. And, it is important not just in terms of storage limits, but it is also important because you cannot choose, identify, develop adequate treatment technologies unless you know what's in the barrels and based on what I've seen, I'd certainly hope that the -- what's it called now -- the waste stream and residue identification and characterization report does a better job than the past one does and is, in fact, reliable enough that we can

tell what's out there because only then are we going to be able to figure out what the best treatment technologies are.

Response 35

The Waste Stream and Residue Identification and Characterization Report is superior to the past effort for several reasons. First, this report is more detailed than past efforts. We are characterizing wastes and residues closer to the point of generation so that we have a better understanding of individual waste and residue streams instead of bulk consolidations of those streams. Second, the organization preparing the report is working very closely with the generators to ensure that the information presented in it is accurate and current. Third, there will be a concerted effort to maintain this report so it is kept current and does not become only a historical document descriptive of one moment in time.

Comment 36

I think that having incorrectly labeled wastes or incorrectly characterized or insufficiently characterized wastes can lead to a problem that I see occurring at the plant, which is the tendency to go for goldplated solutions. And, that's an issue that I think deserves some scrutiny by DOE and some more questioning from DOE to its contractor because just like DOE shouldn't be accepting 20,000 dollar bills for drilling a well when you can get them drilled for 2,000. So, too, something like incineration may be substantially more expensive than using vacuum pumps to suck off the organics in waste barrels, using distillation columns, using a variety of other things, which I don't see here as treatment technologies or as potential Plan Bs. Although it is true that for the first time in here there was a little hint that maybe incineration wasn't going to happen -- and, it's nice to know that you're at least considering alternatives to that -- but, I don't think you're looking necessary -- you're looking at big scheme, goldplated alternatives and I'm not sure that that's necessary. The School of Mines which has a great reputation in a whole variety of areas is doing a lot of experimentation not with the fanciest treatment technologies for acid mine drainage, but with putting in little wet ones, those kinds of alternatives, low-technology alternatives, simpler, easier alternatives. I would suggest that one of the failings, and it comes through very clearly in the technology development part of this, is that DOE is encouraging its contractor to go out and spend lots of money in lots and lots of fancy solutions and I'm not sure that's the best way to spend our money.

Response 36

We agree. The Department of Energy does not encourage its contractors to spend large sums of money. There is considerable pressure to evaluate remedial solutions issues for operational feasibility and cost effectiveness. Prioritization of technology alternatives is addressed in Section 6 of the FY92 SSP.

If you would like more background on alternative waste technologies, please read "Evaluation of Prospective Hazardous Waste Treatment Technologies for Use in Processing Low-Level Mixed Waste at Rocky Flats" (September 18, 1990). It is available for review at the DOE Public Reading Room at Front Range Community College and the offices of the Rocky Flats Clean Up Commission in Golden.

Comment 37

It's my understanding -- this goes back to the corrective activities issues -- that the plant is not in compliance with Subpart J of RCRA and I don't see anything about that in here and I don't see anything about it in the ADSs.

Response 37

We feel that the plant is presently in compliance with the interim status requirements for Subpart J of RCRA. The necessary procedures, secondary containments, and a tank management program are in effect. Longer range storage tank activities are identified in ADS #5259 and ADS #3149.

Comment 38

Under the storage section, the plan mentions the seven-state solution for TRU waste. Now, granted, this was issued in January of 1991, but that's been a dead solution virtually since it was floated and has no place in this plan. That's not a viable alternative. The Governors unanimously rejected that as an alternative and it seems to me inappropriate to appear in this kind of plan.

Response 38

While DOE is not actively pursuing this alternative, it remains a viable option for interim storage of TRU waste.

Comment 39

In the storage section in Chapter 4, again there's no mention about the fact that the plan is out of compliance with storage requirements at least for the residues to the extent that they are subject now to these same regulations. The fact that you've got an agreement does not mean that you are in compliance. You are out of compliance. You are subject to a schedule. And, right now, you're not even really subject to a schedule because you haven't renegotiated the agreement and so there is no future schedule. You have got to move that stuff into corrective activity. Again, the reason that's important is for funding. It also

would, I think, make this plan more reflective of what's actually going on. And, you read this plan, the only things you have in compliance -- I mean, there's some little Clean Water Act/Clean Air Act stuff, but that's not the major problem of this plant. The major problem at this plant is hazardous waste and there's no clue in this plan that you're out of compliance with anything under RCRA. I think it's grossly misleading.

Response 39

EPA and DOE have negotiated a two year extension to the FFCA for LDRs and are currently negotiating this FFCA and the RCA with CDH. Rocky Flats is also currently preparing a RCRA Part B Permit application for mixed residue storage and treatment.

Comment 40

There's also a statement in here on page 4-13 which I find absolutely frightening. And, that is your intent to put new equipment into Building 771. Now, you may need new equipment to do waste management, but it does not belong in that building and it does not belong in that building for a variety of reasons. That building is incredibly contaminated. There is going to be a big fight about whether that building ever gets to open again and this is a pretty sleazy back door way of trying to get that building open, as far as I'm concerned, and I don't think it's appropriate in here. And, I would expect this to become an issue in the Site-Specific Plan -- I'm sorry, in the site-specific EIS and a variety of other places. I would suggest that if you have to put new equipment someplace for waste treatment, 774 which is a waste treatment building might be an appropriate place. There may be other places where it's appropriate, but it ain't in 771.

Response 40

New waste treatment equipment is being installed in Building 774. The reference to Building 771 in the FY91 SSP was made in error.

Comment 41

There is very little in the Site-Specific Plan that is reflective of the DOE Orders, in general. Now, you mention the DOE Orders as something that's covered in this plan back where you go through the list. It's at Chapter 9, you go through the list of federal, state, local, regulatory requirements. There's all kinds of things that are insufficient about Rocky Flats' compliance with the DOE Orders that aren't in here. And, based on what we've done on the national Five-Year Plan, I was sort of unaware that that was covered under the scope. It's either got to be in or out. And, with the exception of the reference back in Chapter 9, it doesn't appear to be covered here. There's very little in the front part of this plan that deals with pure rad wastes or with the DOE order system with the possible exception of

some mentions of the OUs that are rad and rad only. So, it seems to me that you either have a lot more to do on that or that you need to be more specific about which portions of the DOE Orders are actually at issue or the subject of the Site-Specific Plan.

Response 41

DOE Orders cover operational and environmental activities at DOE facilities. These orders are also used as the basis for internal operational procedures and are very extensive. Like other laws and regulations, DOE Orders do drive ER&WM activities and specific Orders are identified as activity drivers in the FYP ADSs. Continuing efforts are made at Rocky Flats to achieve compliance with all applicable Orders. All DOE Orders and the FYP are available for review at the Rocky Flats Reading Room.

Comment 42

This plan isn't particularly clear in terms of the relationship to the national budgeting process and I think that's not necessarily a fault of the plan. I think there's not a lot of communication and not as much communication as there needs to be and not as much integration between any of the field offices and headquarters about what's going on with prioritization. Certainly, the messages that we got at the external review group meetings are very different from what I've heard from Dave Simonson and other people at the plant in terms of how the budgeting is being done, what factors are being considered, what the marching orders are from headquarters internally to you guys versus what they're saying externally about what's going to happen in prioritizing activities. And, you've all heard me say this before. To the extent that being more up front and forthcoming and integrating the public into the process could provide some public support for what Rocky Flats is arguing for in terms of money, either internally within DOE or eventually on the Hill, then it would be helpful and I think beneficial to the community for you folks to stop looking at us as the enemy all the time and in every situation and try to bring us into the process.

Response 42

A brief explanation of the national budgeting process has been included in Section 1 of the FY92 SSP and will hopefully help the public understand this lengthy and complicated process.

COMMENTOR: Barbara Barry, Colorado Department of Health,
Rocky Flats Program Director

Comment 43

These plans, due to their sequence of timing behind the budget submittals, are actually implementation plans for how to spend whatever it was that you were successful in securing in a promissory fashion for a fiscal year way ahead. That makes it very hard for the public to rely on a commitment that appears in a plan. The word "plan", itself, means something to this public in anticipating that you will go forth and accomplish certain things. Here, you have a series of very serious assumptions which if they're put in their correct perspective on the timing should already be known and very firmly established. It would help the public a lot if they understood that this was an expenditure plan for something that already had happened and indeed this kind of effort, this public involvement and this commentary, needs to be occurring in a forum on the Five-Year Plan which is the predicatory item for what it is that you will be asking for budget purposes.

Response 43

Please refer to comment and response numbers 2 and 42.

Comment 44

We're not particularly comfortable with the information that has reached us, so far, regarding the differential cases, the priority setting system, notwithstanding, and we have great difficulties with that, superimposing that on the actual management of monies. We're not comfortable that we're getting an accurate sense of what happens between Case 1, which is what's presented in the expenditure Site-Specific Plan, and what really goes down with Cases 2 and 3. And, those are the things that underlie your qualifications that are otherwise called assumptions in Chapter 7.

There are some ways to cure this, one of which is to write a revision and issue it for everyone on the true picture of the Site-Specific Plan for fiscal '91 after the deal is done. And, the same would be absolutely true for fiscal '91, for which the three cases are now under review, and we do continue hearing that Case 3 is the most likely package for funding. It does not accomplish what Case 1 dimensions for fiscal '91 or fiscal '92 looked like as they have been presented for public discussion.

So, we would like to see a final wrap-up. And, in doing that, you would also be in a position to show the entire complex of funding and the breakdown by program that would take care of such matters as no monies appearing for certain waste management activities and the other concerns that we've been talking about here tonight.

Altogether, we do appreciate the fact that you're playing catch-up and that there's a lot to bring forth that has not been an available tool in the past, but we can't leave it just as it has been stated, so far, that comments on '91 Site-Specific Plan will be attended to in '92 site-specific planning because that one has already gone by. We really need to have a good feel for how these comments will drive the three cases or the two cases that you will construct out of the next Five-Year Plan and will drive the activity data sheets and will drive the fiscal '93 Site-Specific Plan.

Response 44

Preliminary funding decisions are reflected in the final Five-Year Plan. With regard to Case 1 and Case 3 mentioned in Section 1 of the FY92 SSP, Case 3 was developed based on a funding cap dictated by DOE/Headquarters and only affects FY93 and beyond. This does not mean that funding for FY92 will not change from what is indicated and the idea of providing an update when firm budget numbers are available is a good one. A "final wrap-up" or addendum to the SSP after budgets have been finalized will be considered. Also refer to comment and response #42.

The following comments were submitted in writing.

COMMENTOR: The Rocky Flats Cleanup Commission

Comment 45

Pages 1-7, 8: The Rocky Flats Cleanup Commission questions the use of the priority system outlined in these pages and asks whether it agrees with current schemes used by DOE headquarters.

Response 45

The priorities outlined in the FY92 SSP have been updated and reflect those priorities established by DOE/Headquarters for use in writing the FY93-FY97 FYP. They are current as of January 1991.

Comment 46

Page 1-17: In the listing of external organizations involved in environmental activities you should include the Rocky Flats Cleanup Commission since we are the official TAG recipient to oversee cleanup activities at Rocky Flats.

Response 46

Please refer to comment and response number 7.

Comment 47

Page 1-18: As we have stated on many occasions, the Cleanup Commission feels we should have the opportunity to contribute a regular, unedited editorial/commentary to the Rocky Flats Update.

Response 47

Please refer to comment and response number 8.

Comment 48

Page 1-20: The "roadmaps" and the Performance Measurement System that you describe should be made available for review and comment by our group and other interested parties.

Response 48

The "Roadmaps" are a DOE Headquarters initiative at selected sites around the nation, and we will discuss your request with Washington. The Performance Measurement System, a Department of Energy Rocky Flats Office/EG&G document, is still in its development stages. When we get the bugs worked out, the decision will be made whether to release the document or not.

Comment 49

In light of the timing between the budget process and that availability of these Site-Specific Plans, we would encourage that you make a greater effort to involve the public in the actual budget planning process. We recognize that the Site-Specific Plan for FY92 will be available before the actual start of FY92, but the important budgetary inputs have already been made. You should consider issuing these plans during the actual planning process for your budget request when our comments would have more direct impact.

Response 49

Please refer to comment and response number 2.

Comment 50

Why don't you include compliance for items such as land disposal restricted wastes and residues in the list of corrective activities? Since you describe corrective activities as having first priority, we believe that RCRA compliance items should be included.

Response 50

Please refer to comment and response number 24.

Comment 51

In future Site-Specific Plans we will want to see a discussion of decontamination and decommissioning activities.

Response 51

Rocky Flats is not currently planning major decontamination and decommissioning activities, but will include discussion of such activities in future SSPs as appropriate.

Comment 52

We would encourage participation by the Technical Review Group in all work plans and early drafts for environmental restoration projects.

Response 52

Review of work plans and other documents associated with environmental restoration activities has been negotiated by DOE/CDH, and EPA, as part of the IAG and provides for timely technical review of all documents. Also refer to comment and response number 3.

Comment 53

Page 3-23: We request that you should seek full public input in deciding the design standards, installation, and operation of the Radiological Ambient Monitoring Program.

Response 53

Please refer to comment and response number 5.

Comment 54

Page 3-26: You state in the last paragraph, "The existing dams were designed as short-term water retention structures, and long-term water retention is a new requirement that cannot currently be met by these dams." We strongly suggest that you address and correct this problem as quickly as possible with full public disclosure of your plans and activities.

Response 54

Please refer to comment and response number 9.

Comment 55

Page 3-27: Your statement in the last part of the first full paragraph, "Existing water quality data and water treatment approaches are inadequate to assure that pond releases will continue to meet standards," causes us great concern. We request that you address this situation immediately and provide continual updates about how you plan to meet the standards.

Response 55

Please refer to comment and response number 9.

Comment 56

Enclosures should be used for all invasive activities to protect the workers and the community.

Response 56

Please refer to comment and response number 4.

Comment 57

Page 4-3: Waste stream characterization must analyze the waste itself and not just the process. We suggest you sample each drum to identify exactly the contents and then analyze the synergistic effects of the wastes contained therein. There must be a materials/mass balance program implemented so that all possible sources of waste are identified and accounted for.

Response 57

Hazardous and low-level wastes are characterized by laboratory analysis. TRU wastes and residues cannot currently be tested in a lab and consequently, these waste streams are characterized by process analysis. A mass balance study of material into and out of the plant is being conducted as a Waste Management activity and will be integrated into WEMS.

Comment 58

Page 4-3: You mention that you will provide money for health studies, but when we consult the budget on page A-3 there is no mention of ADS #3294B that would do so. Is there money allocated for these health studies and what is the exact nature of them?

Response 58

Funding for these health studies was omitted from the FY91 SSP unintentionally. This funding has been allotted to the State of Colorado as follows: FY91, $2.4 million; FY92, $2 million; FY93, $1 million; and FY94, $500K. The state will use these funds to enhance environmental monitoring and to expand health studies of the public surrounding Rocky Flats.

Comment 59

Page 4-4: In the description of reclassifying wastes through better assaying techniques, what are the exact numbers and how do they relate to the storage limits for the various classes of wastes?

Response 59

Current available storage:

TRU-mixed waste - 536.8 cubic yards
Low-level waste - does not require permitted storage
Low-level mixed waste - 14,501.1 cubic yards
Hazardous waste - 29.9 cubic yards

Comment 60

Pages 4-6: You should add to your list of promising waste minimization activities the highly effective concept of no resumption of waste generating production activities.

Response 60

DOE is currently planning on resumption activities at Rocky Flats.

Comment 61

Page 4-13: You describe microwave solidification. We strongly oppose thermal treatments unless they are in a closed-loop system. We would like to see the results of all tests done with this system.

Response 61

While microwave solidification is not a closed-loop system, gases or vapors that are produced using this process will be collected, contained, and properly treated. Testing results will be available through the DOE Technology Transfer Office.

Comment 62

Page 4-13: Due to problems with the HEPA filter frames and other deficiencies, Building 771 is not safe enough to warrant moving new equipment into it. You must consider safer alternatives.

Response 62

Please refer to comment and response number 40.

Comment 63

Page 4-16: We strongly encourage that you pursue the "zero-discharge" study and incorporate the treated waters produced by the 881 Hillside and 903 Pad remedial actions.

Response 63

"Zero discharge" studies are underway and are listed and statused in Section VII.C.I.b of the Draft Rocky Flats Surface Water Management Plan. The plan is available for review at the public repositories listed in Appendix C.

Comment 64

Page 4-17: The "seven-state" proposal is a dead issue. We feel that you should not consider any alternatives for interim storage until you have solved your permanent storage problems. In the near-term, when you reach your storage limits, production should cease. You need to concentrate your full energies and resources to develop a permanent waste storage site. We request that the NEPA documentation for near-term storage options should be made available as soon as possible and that it be incorporated into future versions of this plan.

Response 64

All storage at Rocky Flats is considered to be interim storage, which is used until waste can be disposed or moved to a permanent storage facility. Nevada Test Site and WIPP will be used as permanent storage/disposal sites for Rocky Flats' waste. Additional interim storage may be necessary at a site other than Rocky Flats if Nevada Test Site and WIPP do not begin accepting waste as planned.

Some level of NEPA documentation is required for all activities that may impact the environment, including new storage facilities. NEPA documentation will be generated as required.

Comment 65

Page 4-18: We believe that compliance with residue limits should be a corrective activity and that the new residue storage facility should be RCRA permitted.

Response 65

The new residue storage facility will be permitted as required for mixed residues. Also, please refer to comment and response number 24.

Comment 66

Any allowances for storage above current limits should be only for cleanup activities.

Response 66

Storage of waste volumes above established limits is currently not allowed.

Comment 67

Page 4-22: The section at the top of the page, Hazardous Wastes, does not adequately portray the true nature of the problem with compliance for LDRs. Given the most recent deadline extension, the problem is far from being resolved as this section would have the reader believe. If you submitted all the necessary reports in September 1990, why have you sought deadline extensions and what are the deficiencies in your plans? How do you propose to correct the situation? When will you be in compliance?

Response 67

Compliance with RCRA LDRs is complex and will include development of new technologies. Because the success of technology solutions is not immediate and is difficult to predict, a planned program, as is outlined in the FFCA, is necessary to reach compliance.

Comment 68

Many of the plans for waste disposal you premise on the availability of offsite storage such as WIPP or the Nevada Test Site. Suppose these facilities are not available. This plan does not address backup plans and as such is seriously flawed. Will future plans attempt to address alternative scenarios.

Response 68

Please refer to comment and response number 29.

Comment 69

You need to address waste transport. Any waste that has to be moved as a result of waste storage policy should be done so only by rail in TRUPACT-type containers that pass all tests for integrity, including the crush test. We ask that all future plans include discussion of offsite transport of stored wastes as a separate section.

Response 69

The DOE Transportation Management Program operates under the Office of Technology Development, managing transportation needs throughout the DOE complex. This program encompasses all facets of transportation, including training, risk analysis, participation in the national emergency preparedness system, regulatory compliance, computerization of shipping operations, development and testing of new materials and packaging configurations, and information exchange with the public. The most suitable means of transporting a given waste form is determined through study and analysis performed under this program.

Facility-specific offsite transport analyses and risk assessments have been conducted by DOE. These studies have been done for WIPP (see the Final Supplement to the WIPP EIS), the Nevada Test Site, etc. Recommendations in these documents are for the safest possible transportation and include rail transport in TRUPACT containers for specified wastes. Transport of specific Rocky Flats waste forms is discussed in the Disposal portion of Section 5.

Comment 70

The Rocky Flats Cleanup Commission's major concern with the technology development strategies is the over-emphasis on thermal treatment processes, including the FBU and the controlled air incinerator. We would like to encourage that more research dollars go towards alternatives to thermal processes as described on page 5-6.

Response 70

EG&G and DOE are committed to evaluating and, where possible, implementing alternative treatments.

Comment 71

All technological advances that involve thermal treatments must be subjected to rigorous permitting procedures before they enter large-scale testing or application.

Response 71

All remedial technologies will be permitted if required by regulatory agencies.

Comment 72

You might consider investigating the supercritical digestion/oxidation process, a closed-loop system that the EPA is investigating.

Response 72

Supercritical water oxidation work is being pursued at LANL and is one of the thermal treatment alternatives being considered for implementation at Rocky Flats.

Comment 73

The most effective way of managing a quality assurance program is subjecting it to rigorous independent oversight.

Response 73

Rocky Flats currently has a QA program for all sampling, analysis, and data entry activities. Independent contractors provide some of these oversight functions. The Quality Assurance Project Plan is available for review at the Rocky Flats Reading Room.

Comment 74

The most glaring difficulty with your assumptions is that they are too optimistic and that they provide no means to develop contingencies if they are wrong. Nothing is static, not the DOE, its contractors, or federal, state, or local governments. For example, under 7.1.2, you state "commitments made to date will be honored." Already you have been unable to fulfill some of your commitments because of "increased security concerns." In this same section you mention that "DOE structure will remain the same," but now we hear of plans to phase-out the Ahearne Commission. In section 7.1.5, you don't allow for the possibility that third parties may bring suit against you. In the future you must outline strategies that will address changes in your assumptions.

Response 74

It is necessary for DOE and EG&G to make and state assumptions when drawing up plans. Assumptions may vary depending upon the type of plan being written. While potential problems and changes are considered, the SSP is a near-term plan and therefore the assumptions used for this plan are indicative of a relatively static environment. Because the SSP is published annually, strategies, assumptions, and schedules can be adjusted as new information becomes available.

Comment 75

You do not address the cleanup program for the plutonium-contaminated ducts. It should be a part of Corrective Activities.

Response 75

Cleanup of plutonium in ducts is funded under the resumption program (DOE/DP). This activity is a maintenance function of production facility and is funded as such. Please refer

to comment and response number 1 for a definition of those activities to be funded under Corrective Activities.

Comment 76

At some point you must begin to admit and address the extent of contamination in the criticality lab.

Response 76

As a result of many years of use as a research facility, the Critical Mass Laboratory (CML) in Building 886 has become contaminated with uranium. Some of the radioactive (alpha particle) contamination was the result of a single event which occurred on March 12, 1987. The CML is not currently engaged in any experimental research or work programs. It is in a shut down state and only requires entry for maintenance activities.

The contamination is contained, will not spread, and does not pose a threat to workers, the public, or the environment. The area is locked for material safeguards and radiation control purposes. There are signs posted at the entrance to the laboratory that warn of the contamination. A decision by DOE on whether to decommission the entire laboratory or clean it up is pending. In the interim, EG&G is allocating funds to begin decontamination activities that are necessary, whether or not the lab is restored to full operation. This is not considered either a waste management or an environmental restoration activity.

Comment 77

When it is appropriate and timely, the procedure for renewal of the operator's contract should be addressed in the Site-Specific Plan as it relates to environmental restoration. When is the contract to be renewed and what are the criteria for awarding the fee? How are incentives structured and awarded based on environmental restoration performance? Who makes these decisions?

Response 77

The procedure for renewal of the Rocky Flats Plant operations contract is not within the scope of the Site-Specific Plan. However, environmental and waste management performance goals are strongly represented in the plant's overall goals. Please contact the Rocky Flats Information Office for additional details regarding award fees.

COMMENTOR: Mildred M. Mulligan, Aurora, CO

Comment 78

I have reviewed the Plan and am disturbed by the apparent direction that the Department is moving in. It appears that the monies available are being allocated for inventorying, waste management and minimization automation while relieving Rocky Flats from the responsibility of fines. In my opinion the monies available should be allocated solely for the purpose of cleanup of the plutonium and other toxic wastes and for the closing down of the plant forever. It is patently ridiculous for there to be a plutonium plant in the midst of a heavy population center such as the Front Range. For the sake of everyone living here now and the generations to come, I appeal to the Department of Energy to do what is right and close down the Rocky Flats Plant in the safest, quickest way possible, using the funds available for the purpose. I advocate that the Plan be revised accordingly.

Response 78

The purpose of most waste management activities is to bring the plant into compliance with applicable regulations. In some cases a compliance agreement has been made with the state and EPA to outline the steps to reach compliance. While fines are indeed avoided by meeting compliance agreement requirements, the purpose of performing the outlined activities is to follow a deliberate path to full compliance.

COMMENTOR: Neal G. Berlin, City Manager, Arvada

Comment 79

We encourage the Department of Energy and EG&G to double-side copies of all information printed for public review. In addition, efforts should be made to print materials on recycled paper and inform the public of the practice.

Response 79

Future copies of the SSP will be double-sided and printed on recycled paper.

COMMENTOR: Marcia S. Bryant, Arvada, CO

Comment 80

[In reference to page 1-7] I feel Rocky Flats hasn't been operating in a safe and environmentally sound manner. I hope that Secretary Watkins was being sincere when he said that "protection of the environment and the public" was and is a top priority for all DOE operations. Total compliance?

Response 80

Rocky Flats is committed to operating in a safe and environmentally sound manner.

Comment 81

[In reference to page 1-11] These pages of explanation on the different branches or departments at Rocky Flats are good. (Problems with EG&G: Only restart of plant processing is mission -- mission should be cleanup of Rocky Flats Plant.)

Response 81

The mission of Rocky Flats is to produce plutonium triggers, however, environmental restoration and waste management activities have extremely high priorities. Environmental restoration activities have continued even while plant operations have been shut down.

Comment 82

[In reference to page 3-17] I am very concerned in regard to the transportation of pondcrete to the Nevada Test Site. Is the Nevada Test Site ready for acceptance of more of these shipments of pondcrete?

Response 82

The Nevada Test Site is not currently ready to accept additional pondcrete shipments. No shipments will be made until all necessary systems and permits are in place.

Comment 83

[In reference to section 10.1] Rocky Flats Actions: It is very important that proper level of NEPA documentation be in place before allowing funds to be made available for construction activities.

Response 83

NEPA documentation is necessary for any activity that may impact the environment and must be in place before funding for major equipment or construction is released.

Comment 84

I feel it is very important for the Site-Specific Plan to be sure to adhere to all environmental compliance requirements.

Response 84

The SSP describes Rocky Flats's plans to adhere to environmental compliance requirements.

Comment 85

Safety of the workers and health concerns also need to be addressed as the clean-up, waste management, and environmental restoration processes are taking place. Health of the workers should be monitored, and health records could be kept very accurately so that the workers know what kind of health concerns they might have.

Response 85

The health of workers is monitored at regular intervals. Records are maintained and workers are encouraged to review their respective information. This is a health and safety issue and is considered to be outside the scope of the SSP.

Comment 86

The Rocky Flats Plant should continue to be monitored for soil, groundwater, surface water, and air problems.

Response 86

Rocky Flats monitors soil, groundwater, surface water, and air on a routine and special case basis. Pursuant to federal and state regulations and DOE Orders, this environmental data for Rocky Flats has been reported at monthly public meetings for the past twenty years and will continue to be reported in this manner.

Comment 87

Cleanup and shutdown of Rocky Flats are the two main priorities that I have concerning the Site-Specific Plan for Fiscal Year 1991.

Response 87

DOE is currently planning on the resumption of production activities at Rocky Flats. Cleanup of Rocky Flats is also our priority and will continue in accordance with the IAG.

COMMENTOR: Melinda Kassen, Environmental Defense Fund

Comment 88

While the release of the FY91 SSP in January 1991 is much better than release of the FY90 plan in June 1990, it is still 1/4 of the way through the year and the public comment session is happening today, halfway through the year. Therefore, EDF strongly supports DOE's proposal to issue the FY92 SSP in draft in August 1991 and take comments thereon prior to the beginning of FY92.

Response 88

Please refer to comment and response number 31

Comment 89

Based on what EDF staff have been told by Department of Energy (DOE) personnel have told EDF staff, neither DOE nationally nor the Plant used the priority system described in pages 1-7 to 1-8 of the SSP to prepare either the FY91 Five-Year Plan or the Plant's SSP.

Response 89

Please refer to comment and response number 32.

Comment 90

The inclusion of "Base" environmental management activities in the budgetary figures for environmental restoration is misleading. By including monitoring, ongoing support activities, and permit requirements with environmental restoration, DOE gives the impression that it is spending more on clean up than it actually is (in this case $44 million versus $141

million). At best, these activities belong in the operations category (waste management & operations); however, EDF suggests as preferable that the FY92 SSP simply add a category for base environmental programs.

Response 90

DOE will consider your suggestions. Also, please refer to comment and response number 37.

Comment 91

Permitting for out-of-compliance wastes is not properly part of waste management; rather the Plant should include these costs in Corrective Activities. Similarly, and perhaps more importantly, under Corrective Activities, the Plant has listed no actions associated with coming into compliance with the Resource Conservation and Recovery Act (RCRA). This is absurd. The Plant's egregious examples of non-compliance with environmental law, as well as the bulk of the deficiencies identified by the Tiger Team and by the regulatory agencies have to do with the Plant's RCRA failings. Notwithstanding the fact that DOE has entered into agreements with EPA and the State that set forth schedules for achieving compliance as to some of the violations, this is not true for all of them and even so, the agreements are irrelevant to whether the activities necessary to achieve compliance belong in this category. They do, clearly. That makes them all of the highest priority, such that DOE must seek full funding for them, pursuant to promises DOE officials made to the External Review Group for Prioritization.

Response 91

Please refer to comment and response number 34.

Comment 92

EDF has received information from regulatory agency personnel as well as from DOE and EG&G staff that the Plant still has inadequate data to characterize its wastes correctly. Since identifying which wastes are in what categories depends on this information, not to mention the fact that the regulatory agencies and DOE cannot adequately evaluate proposed treatment technologies without this information, ADS #5055 (The Waste Stream and Residue Identification and Characterization Report) becomes time critical. DOE must fully fund this activity.

Response 92

Please refer to comment and response number 35

Comment 93

To support the Plant's critical waste characterization efforts, DOE must upgrade its laboratory's quality assurance. Too many waste samples show up with methylene chloride where that organic may be present due to laboratory error rather than the presence of organics in the waste barrels. DOE must fully fund this activity.

Response 93

Quality Assurance is an important and integral part of Rocky Flats analytical programs. Methylene chloride can be a laboratory containment in Rocky Flat's and in other analytical labs. Rocky Flats will make every effort to eliminate this problem.

Comment 94

EDF is disappointed with DOE's lack of initiative in encouraging its contractors and the national laboratories to pursue aggressively affordable and effective waste management and treatment technologies. Goldplated solutions are, of course, hard to sell in this day of fiscal restraints. Yet, having grudgingly recognized that the Plant may not be able to rely on incineration for many of its waste streams, DOE is not pursuing several alternatives that have the potential to be both less expensive and less controversial than the alternatives they are pursuing, for example, using a vacuum pump or distillation columns to remove organics from certain waste forms.

Response 94

Please refer to comment and response number 36.

Comment 95

In neither the waste management nor corrective activities sections of the SSP does the Plant mention that it must take a variety of actions to achieve compliance with Subpart J of RCRA.

Response 95

Please refer to comment and response number 37.

Comment 96

The SSP includes the "seven state solution" for storage of TRU mixed wastes (p. 4-17) and fails even to mention treatment alternatives for land disposal restricted wastes under the treatment discussion in section 4.4.

Response 96

Please refer to comment and response number 38.

Comment 97

In the storage section under waste management, the SSP fails to mention anything about the Plant's non-compliance (e.g., with the vast majority of stored residue).

Response 97

Please refer to comment and response number 39.

Comment 98

EDF strongly objects to the Plant's proposal to put new equipment into building 771, as described on page 4-13. Given the extensive contamination of that structure, and given that Building 771 may never restart plutonium operations (at least to do the primary job for which it was built, i.e., plutonium reprocessing), putting new equipment into this building appears to be a blatant effort to force its restart unnecessarily. Please.

Response 98

Please refer to comment and response number 40.

Comment 99

For better readability, EDF suggests that the "generic schedule" on pages 3-5 to 3-6 should be used in chart form to show what is being done in FY92 at each Operating Unit.

Response 99

FY92 milestones specific to each OU are detailed in the FY93-97 FYP. This information is outside the scope of the SSP.

APPENDIX G

BIBLIOGRAPHY

BIBLIOGRAPHY

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